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TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1940

No. 741

KLAXON COMPANY, PETITIONER,

vs.

STENTOR ELECTRIC MANUFACTURING COMPANY, INC.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

PETITION FOR CERTIORARI FILED FEBRUARY 8, 1941.

CERTIORARI GRANTED MARCH 3, 1941.

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., MARCH 31, 1941.

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United States Circuit Court of Appeals.

FOR THE THIRD CIRCUIT.

STENTOR ELECTRIC MANUFACTURING COMPANY, INC.,
Plaintiff-Appellee,

vs.

KLAXON COMPANY,
Defendant-Appellant.

No. 7398.

On Appeal from a Judgment of the United States District Court for the District of Delaware.

APPELLANT'S APPENDIX.

JAMES D. CARPENTER, JR.,
75 Montgomery Street,
Jersey City, New Jersey,
Counsel for Appellant.

HENRY M. HOGAN,
ROBERT H. SPREEN,
KEVIN McINERNEY,
Of the New York Bar,
Of Counsel.

[The figures on the right indicate the pages on the official record on file.]

The [illegible] Jersey City, N. J.

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MAY 17 1940

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Docket Entries.*

June 1, 1929	Praecipe filed; same day summons issued, returnable 2nd Tuesday in June, 1929.
June 11, 1929	Marshal returns on summons, "Served", &c.; same day writ filed.
•	• •

Dec. 2, 1937	Motion of defendant filed; same day order granting leave to strike out pleas and file new plea; same day order filed.
Dec. 2, 1937	Defendant's pleas filed and rule rejoinder on or before December 12, 1937. (Exit rule.)
•	• •
Apr. 13, 1938	Opinion of court, filed.
Apr. 15, 1938	Order sustaining demurrer to defendant's plea with judgment of respondent ouster and general leave to amend.
Apr. 28, 1938	Defendant's plea in abatement filed and rule replications on or before May 9, 1938. (Exit rule.)
•	• •
May 14, 1938	Order striking defendant's second plea in abatement; same day order filed.
•	• •
Apr. 26, 1939	Amended complaint filed.
June 12, 1939	Answer to amended complaint filed.
•	• •
June 24, 1939	Plaintiff's bill of particulars, filed.

* Only docket entries set out in stipulation of counsel included in transcript of record.

Docket Entries.

June 26, 1939	Motion of plaintiff filed; same day order granting leave to amend caption, process, pleadings, &c. so name of plaintiff shall read Stentor Electric Manufacturing Company, Inc.; same day order filed.
•	• •
June 28, 1939	Answer to complaint as amended, filed.
•	• •
July 17, 1939	Motion by defendant for directed verdict; same day motion denied.
	—3—
July 18, 1939	Verdict: For plaintiff and damages assessed at the sum of one hundred thousand dollars ($100,000.00).
July 20, 1939	Direction to enter judgment, filed.

Judgment.

And now, to wit, this twentieth day of July, A. D. 1939, it is considered and adjudged by the Court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of one hundred thousand dollars ($100,000.00) and its costs in and about this suit expended, and have execution therefor.

Attest: H. C. MAHAFFY, Jr., Clerk.

•	• •
July 26, 1939	Motion of plaintiff that judgment be corrected to include interest, &c., filed.
July 27, 1939	Motion of defendant that verdict and judgment be set aside or for a new trial, filed.
•	• •

Docket Entries.

Aug. 15, 1939	Additional grounds in support of defendant's motion to have verdict and judgment set aside, &c., filed.
•	• •
Nov. 28, 1939	Opinion of Court filed.
Dec. 14, 1939	Order that defendant's motions to have verdict and judgment entered thereon set aside and new trial granted, &c.; same day order filed. (Exit copy to defendant's attorney.)
D[illegible]. 14, 1939	Order that interest be recovered by plaintiff and that judgment heretofore entered be amended and corrected, &c.; same day order filed. (Exit copy to defendant's attorney.)

Judgment

And now, to wit, this 20th day of July, A. D. 1939, it is considered and adjudged by the court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of One hundred sixty

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thousand eight hundred twenty one and 92/100 dollars ($160,821.92) and its costs in and about this suit expended, and have execution therefor.

Attest: H. C. MAHAFFY, Jr., Clerk.

•	• •
Feb'y. 9, 1940	Notice of appeal by defendant, filed; same day copy mailed to attorneys for plaintiff.

Defendant's Plea in Abatement.

(Filed April 28, 1938)

AND NOW COMES the defendant in the above-entitled cause and leave of Court having been first had and obtained, pleads the following plea to the plaintiff's declaration heretofore filed in the above-entitled cause:

(1) And the said defendant, by Hugh M. Morris and Ivan Culbertson, Esquires, its attorneys, comes and defends the wrong when &c. and prays judgment of the said writ of the said plaintiff because it says that the plaintiff was, prior to May 26, 1919, a corporation organized and existing under and pursuant to the laws of the State of New York, and that the said plaintiff was, by voluntary action, dissolved as a corporation existing under the laws of the State of New York, a certificate of dissolution having been filed in the office of the Secretary of State, Division of Corporations of the said State of New York on or about May 26, 1919, approximately ten years prior to the institution of the within cause of action; that at the time of said dissolution, the General Corporation Law of the State of New York, pursuant to the provisions of which the plaintiff corporation existed, Section 221 of Article X entitled "An Act Relating to Corporations Generally, Constituting Chapter Twenty-three of the Consolidated Laws", being Laws of 1909, Chapter 28, provided as follows:

"§221. Dissolution of stock corporation before expiration of time limit.—Any stock corporation, except a moneyed or a railroad corporation, may be dissolved before the expiration of the time

limited in its certificate of incorporation or in its charter as follows:

"1. The board of directors of any such corporation may at a meeting called for that purpose, upon at least three days' notice to each director, by a vote of a majority of the whole board, adopt a resolution that it is in their opinion advisable to dissolve such corporation forthwith, and thereupon shall call a meeting of the stockholders for the purpose of voting upon a proposition that such corporation be forthwith dissolved. Such meeting of the stockholders shall be held not less than thirty nor more than sixty days after the adoption of such resolution, and the notice of the time and place of such meeting so called by the directors shall be published in one or more newspapers published and circulating in the county wherein such corporation has its principal office, at least once a week for three weeks successively next preceding the time appointed for holding such meeting, and on or before the day of the first publication of such notice, a copy thereof shall be served personally on each stockholder, or mailed to him at his last known post-office address. Such meeting shall be held in the city, town or village in which the last preceding annual meeting of the corporation was held, and said meeting may, on the day so appointed, by the consent of a majority in interest of the stockholders present, be adjourned from time to time, and notice of such adjournment shall be published in the newspapers in which the notice of the meeting is published. If at any such meeting the holders of two-thirds in amount of the stock of the corporation, then outstanding, shall, in person or by attorney, consent that such dissolu-

tion shall take place and signify such consent, in writing, then such corporation shall file such consent, attested by its secretary or treasurer, and its president or vice-president, together with the powers of attorney signed by such stockholders executing such consent by attorney, with a statement of the names and residences of the then existing board of directors of said corporation, and the names and residences of its officers duly verified by the secretary or treasurer or president of said corporation, in the office of the secretary of state.

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"2. The secretary of state shall thereupon issue to such corporation, in duplicate, a certificate of the filing of such papers and that it appears therefrom that such corporation has complied with this section in order to be dissolved and one of such duplicate certificates shall be filed by such corporation in the office of the clerk of the county in which such corporation has its principal office, and thereupon such corporation shall be dissolved and shall cease to carry on business, except for the purpose of adjusting and winding up its business. The board of directors shall cause a copy of such certificate to be published at least once a week for two weeks in one or more newspapers published and circulating in the county in which the principal office of such corporation is located, and at the expiration of such publication, the said corporation by its board of directors shall proceed to adjust and wind up its business and affairs with power to carry out its contracts and to sell its assets at public or private sale, and to apply the same in discharge of debts and obligations of such corporation, and, after paying and adequately pro-

viding for the payment of such debts and obligations, to distribute the balance of assets among stockholders of said corporation, according to their respective rights and interests.

"3. Said corporation shall nevertheless continue in existence for the purpose of paying, satisfying and discharging any existing debts or obligations, collecting and distributing its assets and doing all other acts required in order to adjust and wind up its business and affairs, and may sue and be sued for the purpose of enforcing such debts or obligations, until its business and affairs are fully adjusted and wound up.

"4. After paying or adequately providing for the debts and obligations of the corporation the directors may, with the written consent of the holders of two-thirds in amount of the capital stock, sell the remaining assets or any part thereof to a corporation organized under the laws of this or any other state, and engaged in a business of the same general character, and take in payment therefor the stock or bonds or both of such corporation and distribute them among the stockholders, in lieu of money, in proportion to their interests therein, but no such sale shall be valid as against any stockholder who, within sixty days after the mailing of notice to him of such sale, shall apply to the supreme court in the manner provided by section seventeen of the stock corporation law, for an appraisal of the value of his interests in the assets so sold; unless within thirty days after such ap-

praisal the stockholders consenting to such sale, or some of them, shall pay to such objecting stockholder or deposit for his account, in the manner

directed by the court, the amount of such appraisal and upon such payment or deposit the interest of such objecting stockholder shall vest in the person or persons making such payment or deposit."

That the within cause of action was not in existence at the time of the dissolution of the said Stentor Electric Manufacturing Company as hereinabove set forth and that the said plaintiff was and is without legal capacity to institute or maintain the said cause of action and this it, the said defendant, is ready to verify; wherefore the said defendant prays judgment of the writ aforesaid and that the same may be quashed, etc.

(2) And the said defendant, by Hugh M. Morris and Ivan Culbertson, Esquires, its attorneys, comes and defends the wrong when &c. and prays judgment of the said writ of the said plaintiff because it says that the plaintiff was, prior to May 26, 1919, a corporation organized and existing under and pursuant to the laws of the State of New York, and that the said plaintiff was, by voluntary action, dissolved as a corporation existing under the laws of the State of New York, a certificate of dissolution having been filed in the office of the Secretary of State, Division of Corporations of the said State of New York on or about May 26, 1919, approximately ten years prior to the institution of the within cause of action; that at the time of said dissolution, the General Corporation Law of the State of New York, pursuant to the provisions of

which the plaintiff corporation existed, Section 221 of Article X entitled "An Act Relating to Corporations Generally, Constituting Chapter Twenty-three of the Consolidated Laws", being Laws of 1909, Chapter 28, provided as follows:

"§221. Dissolution of stock corporation before expiration of time limit.—Any stock corporation,

except a moneyed or a railroad corporation, may be dissolved before the expiration of the time limited in its certificate of incorporation or in its charter as follows:

"1. The board of directors of any such corporation may at a meeting called for that purpose, upon at least three days' notice to each director, by a vote of a majority of the whole board, adopt a resolution that it is in their opinion advisable to dissolve such corporation forthwith, and thereupon shall call a meeting of the stockholders for the purpose of voting upon a proposition that such corporation be forthwith dissolved. Such meeting of the stockholders shall be held not less than thirty nor more than sixty days after the adoption of such resolution, and the notice of the time and place of such meeting so called by the directors shall be published in one or more newspapers published and circulating in the county wherein such corporation has its principal office, at least once a week for three weeks successively next preceding the time appointed for holding such meeting, and on or before the day of the first publication of such notice, a copy thereof shall be served personally on each stockholder, or mailed to him at his last known post-office address. Such meeting shall be held in the city, town or village in which the last preceding annual meeting of the corporation was held and said meeting may, on the day so appointed, by the consent of a majority in interest of the stockholders present, be adjourned from time to time, and notice of such adjournment shall be published in the newspapers in which the notice of the meeting is published. If at any such meeting the holders of two-thirds in amount of the stock of

the corporation, then outstanding, shall, in person or by attorney, consent that such dissolution shall take place and signify such consent, in writing, then such corporation shall file such consent, attested by its secretary or treasurer, and its president or vice-president, together with the powers of attorney signed by such stockholders executing such

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consent by attorney, with a statement of the names and residences of the then existing board of directors of said corporation, and the names and residences of its officers duly verified by the secretary or treasurer or president of said corporation, in the office of the secretary of state.

"2. The secretary of state shall thereupon issue to such corporation, in duplicate, a certificate of the filing of such papers and that it appears therefrom that such corporation has complied with this section in order to be dissolved and one of such duplicate certificates shall be filed by such corporation in the office of the clerk of the county in which such corporation has its principal office; and thereupon such corporation shall be dissolved and shall cease to carry on business, except for the purpose of adjusting and winding up its business. The board of directors shall cause a copy of such certificate to be published at least once a week for two weeks in one or more newspapers published and circulating in the county in which the principal office of such corporation is located, and at the expiration of such publication, the said corporation by its board of directors shall proceed to adjust and wind up its business and affairs with power to carry out its contracts and to sell its assets at public or private sale, and to apply the same in discharge of debts

and obligations of such corporation, and, after paying and adequately providing for the payment of such debts and obligations, to distribute the balance of assets among stockholders of said corporation, according to their respective rights and interests.

"3. Said corporation shall nevertheless continue in existence for the purpose of paying, satisfying and discharging any existing debts or obligations, collecting and distributing its assets and doing all other acts required in order to adjust and wind up its business and affairs, and may sue and be sued for the purpose of enforcing such debts or obligations, until its business and affairs are fully adjusted and wound up.

"4. After paying or adequately providing for the debts and obligations of the corporation the directors may, with the written consent of the holders of two-thirds in amount of the capital stock, sell the remaining assets or any part thereof to a corporation organized under the laws of this or any other state, and engaged in a business of the same general character, and take in payment therefor the stock or bonds or both of such corporation and distribute them among the stockholders, in lieu

of money, in proportion to their interests therein, but no such sale shall be valid as against any stockholder who, within sixty days after the mailing of notice to him of such sale, shall apply to the supreme court in the manner provided by section seventeen of the stock corporation law, for an appraisal of the value of his interests in the assets so sold; unless within thirty days after such appraisal the stockholders consenting to such sale, or some of them, shall pay to such objecting stock-

holder or deposit for his account, in the manner directed by the court, the amount of such appraisal and upon such payment or deposit the interest of such objecting stockholder shall vest in the person or persons making such payment or deposit."

That the plaintiff was not subsequent to its said dissolution and is not now engaged in adjusting and winding up its business and affairs and the within cause of action was not brought for the purpose of adjusting and winding up the business and affairs of the plaintiff and therefore the said plaintiff is without legal capacity to institute or maintain the said cause of action and this it, the said defendant, is ready to verify; wherefore the said defendant prays judgment of the writ aforesaid and that the same may be quashed, etc.

(Sgd.) HUGH M. MORRIS,
(Sgd.) IVAN CULBERTSON,
Attorneys for Defendant.

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Opinion of Court on Plea in Abatement.

(Filed April 13, 1938)

Demurrer to plea in abatement.

June 1, 1929 plaintiff brought this action on a license agreement made between the parties May 20, 1918. The agreement provides, inter alia, that defendant shall exploit certain patents and shall pay certain royalties to plaintiff under patent licenses granted by plaintiff to defendant. Payment of such royalties was to continue throughout the life of the patents, namely, until September 29, 1931. The breaches of the licenses for which

plaintiff sues are alleged in these words: "* * * the said defendant, did not use, and at no time thereafter has used, its best efforts to further the manufacture and sale of the articles covered by said contract, and did not maintain, and at no time thereafter has maintained, an efficient organization for the manufacture and sale of said articles, but on the contrary thereof has wholly failed so to do; whereby and as a result whereof the said plaintiff has been and is deprived of large sums of money as royalties which would otherwise have been received by the said plaintiff under the said contract, and whereby the value of said patents and the value of the royalties reserved under said contract has been and is greatly lessened and depreciated, and has been and is wholly de-

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stroyed; to the damage of the said plaintiff", etc.

Defendant pleaded in abatement "that the said plaintiff was, by voluntary action, dissolved as a corporation created by and existing under and pursuant to the laws of the State of New York, a certificate of dissolution having been filed in the Office of the Secretary of State, Division of Corporations, of the said State of New York, on or about May 26, 1919, approximately ten years prior to the institution of the within cause of action, the said plaintiff being therefore without legal capacity to institute or maintain the within cause of action, and this it, the said defendant, is ready to verify; * * *."

The sole issue raised by the demurrer is the legal effect of the dissolution of plaintiff May 26, 1919.

Plaintiff is a New York corporation and its right to institute and maintain this action is governed by the statutes of New York. Every statute of the State of New York relating to dissolved corporations extends the life of such corporations with power to sue in the corporate name without limitation as to time. This court is bound to take judicial notice of such statutes. Moreover,

a decision of the highest appellate court of New York construing such statutes is controlling in a federal court. In a New York Court of Appeals case a corporation defendant had voluntarily dissolved in 1918. In selling its assets

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it had covenanted that certain premises were free from encumbrances. Ten years after dissolution the corporation was sued in its own name for breach of this covenant. The court held under the New York statutes that the corporation could be sued. *New York* v. *New York S. B. Ferry and S. Transportation Co.*, 231 N. Y. 18; 131 N. E. 554.

There is no plea of a statute of limitations in the case at bar. There is no limitation of time in the New York statutes relating to dissolved corporations within which actions in liquidating their affairs must be brought by or against them. In the New York case, cited above, action was brought ten years after dissolution. Moreover there is no statute of limitations of Delaware limiting actions based upon specialties like the license agreement in this case.

The plea in abatement is without merit and the demurrer thereto must be sustained.

(Sgd.) JOHN P. NIELDS,
J.

April 13, 1938.

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Order Striking Defendant's Plea in Abatement.

(Filed May 14, 1938.)

And now, to wit, this 14th day of May A. D. 1938 this cause having come on to be heard upon plaintiff's motion to strike defendant's second plea in abatement, and having been argued by counsel for the respective parties, upon consideration thereof.

IT IS ORDERED by the court that said motion be and hereby is granted and defendant's second plea in abatement be and hereby is stricken from the record.

(Sgd) JOHN P. NIELDS,
J.

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Amended Complaint.

(Filed April 26, 1939.)

COMES NOW, Stentor Electric Manufacturing Company, the plaintiff in the above captioned cause, by Ward & Gray, its attorneys, and amends the declaration heretofore filed herein by it, as follows:

By striking out Count 1 of said declaration and inserting in lieu thereof the following complaint:

1. The Stentor Electric Manufacturing Company was at all the times hereinafter mentioned prior to May 26, 1919, a corporation duly organized and existing under and by virtue of the laws of the State of New York.

2. On or about May 26, 1919, said Stentor Electric Manufacturing Company was voluntarily dissolved in ac-

cordance with the statutes of the State of New York; and at the time of its dissolution as aforesaid, Buell Hollister, Jesse L. Spence, and Charles E. Danforth were all the directors of said corporation.

3. Thereafter the said Charles E. Danforth died, and the said Buell Hollister and Jesse L. Spence are the sole surviving directors of said corporation and are the trustees for its creditors and stockholders and have power to sue in its corporate name.

4. Each of the said trustees is a citizen of the State of New York.

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5. The defendant is and was at all the times hereinafter mentioned a corporation duly organized and existing under and by virtue of the laws of the State of Delaware.

6. The matter in controversy exceeds, exclusive of interest and costs, the sum of Three Thousand ($3,000.00) Dollars.

7. Heretofore on or about the twentieth day of May, A. D. 1918, a certain contract was made between the said plaintiff of the one part and the said defendant of the other part, a copy of which is hereto attached and marked "Exhibit A", wherein and whereby the said plaintiff did covenant and agree to sell and convey to the said defendant all of the property and assets of it, the said plaintiff, of every kind and nature, except Letters Patent, domestic or foreign, and the trade name "Stentor", the ownership of which was in and by said contract specifically reserved.

8. The said plaintiff did, in and by said contract, further grant, license and transfer to the said defendant, for the term of said contract, and subject to its conditions, the

sole and exclusive right to use and employ any and all processes under and in accordance with certain United States Letters Patent and applications for Letters Patent described in a certain Schedule "A" annexed to said contract, or any subsequent improvements thereon which may be made, acquired, owned, or controlled by the said plaintiff upon the inventions, or any of them, described

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in said Letters Patent or applications, and to make, have made, use and sell, telephones and related apparatus and devices and articles made in accordance with the said United States Letters Patent and applications for Letters Patent and improvements thereon, including, but not limited to, automobile or chauffeur telephones; radio head sets; radio loud speakers; marine telephones; fire control telephones for ships; railroad dispatching systems and announcing systems; office inter-communicating systems; apartment house or vestibule telephones; paging systems; tank telephones; and aeroplane telephones; mine telephones; power transmission line telephones; loud speakers and loud speaking announcers, however, or for whatever purposes; cigar lighters; and an improved helmet for aviators, together with all other apparatus and devices and articles, whether or not of like kind to the foregoing, made in accordance with said United States Letters Patent and applications for Letters Patent and improvements thereon.

9. Many of the aforesaid apparatus, but not including radio head sets or radio loud speakers, and devices and articles the plaintiff avers, at and before the time of the making of the agreement herein sued upon, were manufactured and sold by it and all of said devices were or could be put in use at said time and thereafter during the term of the agreement in suit, and the manufacture and sale

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thereof were commercially profitable and would have become and continued profitable.

10. The said plaintiff did covenant and agree, in and by said contract, that said license would remain in full force and effect, if not sooner cancelled or terminated as in said contract provided, for the term of seventeen years from September 29, 1914, except as in said contract set forth.

11. The said defendant in and by said contract covenanted and agreed to and with the said plaintiff that it, the said defendant, would pay to the said plaintiff under said contract, an amount equal to fifty per centum of the net profits realized by the said defendant from the sale of apparatus and devices and articles manufactured and sold under the said patents licensed under said contract, at the times and subject to the conditions in said contract set forth.

12. The said defendant in and by said contract did further covenant and agree to and with the said plaintiff that it, the said defendant, would (1) use its best efforts to further the manufacture and sale of the apparatus and devices and articles covered by the agreement in suit, including but not limited to automobile or chauffeur telephones; radio head sets; radio loud speakers; marine telephones; railroad dispatching systems and announcing systems; office inter-communicating systems; apartment house or vestibule telephones; paging systems, tank telephones; aeroplane telephones; mine telephones; loud

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speakers and loud speaking announcers, however or for whatever purpose used; power transmission line telephones; fire control telephones for ships; cigar lighters;

and an improved helmet for aviators and any and all other apparatus and devices and articles, whether or not of like kind to the foregoing, covered by the agreement in suit; (2) maintain an efficient organization for the manufacture and sale of said apparatus and devices and articles; (3) use its best efforts to further the manufacture and sale of apparatus and devices and articles covered by agreement; (4) maintain an organization for the manufacture and sale of said apparatus and devices and articles; (5) employ salesmen, make sales efforts, advertise, use due care in manufacturing, employ proper personnel for sale and manufacture, use due efforts for improvements and development and employ proper personnel for that purpose; and (6) refrain from manufacturing or selling, for itself or for any other party, any competitive or substitute apparatus and devices and articles, in respect to the apparatus and devices and articles covered by said contract; all of which said covenants, agreements, terms and conditions are fully set forth in the said contract, a copy whereof is hereunto annexed.

13. By virtue of said contract the said defendant at all times from the making thereof and throughout the term of the agreement in suit was fully possessed of said sole

and exclusive rights, grants and licenses in respect of said Letters Patent in said contract mentioned and described.

14. The said contract was at no time cancelled or terminated.

15. The plaintiff at no time within two years of the expiration of the date of the above described patents engaged in the manufacture of the apparatus and devices

and articles described therein and covered thereby, and plaintiff did not, prior to said two years' period, directly or indirectly engage in the manufacture or sale of the apparatus and devices and articles covered thereby.

16. The plaintiff has always, from the time of the making of said contract hitherto, well and truly performed, fulfilled and kept all things in the said contract contained on its part and behalf to be performed, fulfilled and kept, according to the tenor and effect, true intent and meaning of the said contract.

17. The defendant has not performed, fulfilled, or kept anything in the said contract contained on its part to be performed, fulfilled and kept according to the tenor and effect, true intent and meaning thereof, in that after the making of the said contract, after the said defendant was fully possessed of said sole and exclusive rights, grants and licenses in respect of said Letters Patent in said contract mentioned and described it, the said defendant, did not down to and including September 29, 1931, (1) use

its best efforts to further the manufacture and sale of the apparatus and devices and articles covered by the agreement in suit, including but not limited to automobile or chauffeur telephones; radio head sets; radio loud speakers; marine telephones; railroad dispatching systems and announcing systems; office intercommunicating systems; apartment house or vestibule telephones; paging systems; tank telephones; aeroplane telephones; mine telephones; loud speakers and loud speaking announcers, however or for whatever purpose used; power transmission line telephones; fire control telephones for ships; cigar lighters; and the improved helmet for aviators, and any and all other apparatus and devices and articles, whether or not of like kind to the foregoing, covered by the agreement in

suit; (2) maintain an efficient organization for the manufacture and sale of said apparatus and devices and articles; (3) use any efforts at all beginning on or about July 1, 1924, to further the manufacture and sale of the apparatus and devices and articles covered by said agreement; (4) maintain any organization at all beginning with on or about and after July 1, 1924, for the manufacture and sale of said apparatus and devices and articles; (5) employ salesmen, make sales efforts, advertise, use due care in manufacturing, employ proper personnel for sale and manufacture, use due efforts for improvements and development or to do any research or promotional work in respect of the market for any of said devices designed to accomplish similar purposes, or employ proper personnel for that purpose.

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18. The defendant did in fact manufacture and sell or cause to be manufactured and sold competitive or substituted apparatus and devices and articles in respect of the cigar lighter and of radio head sets and loud speakers.

19. The defendant after the making of said contract here sued upon, from time to time ceased the manufacture and sale of all of said apparatus and devices and articles except the said automobile telephones and shortly after the making of said contract refused to manufacture or sell, or to attempt to manufacture or sell any apparatus and devices and articles whatever embodying any of said inventions.

20. As a result of all the foregoing the plaintiff has been and is deprived of large and substantial sums of money which would otherwise have been received by the plaintiff under the said contract, the sums of money reserved to this plaintiff under said contract became of little

value, and whereby the actual and potential value of said patents embodying said inventions and the value of the royalties reserved under said contract have been and are wholly depreciated and destroyed by reason of the discontinuance of the sale of said apparatus and devices and articles, and the said failure of said defendant to further the sale thereof and the other breaches and violations of the said agreement hereinabove set forth, all to the damage of the plaintiff in the sum of One Million ($1,000,000.00) Dollars.

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WHEREFORE plaintiff demands judgment against defendant for the sum of One Million ($1,000,000.00) Dollars, interest, and costs.

(Sgd.) C. A. SOUTHERLAND,
(Sgd.) PAUL LEAHY,
Attorneys for Plaintiff.

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Answer to Complaint as Amended.

(Filed June 28, 1939.)

KLAXON COMPANY, defendant above named, for its answer to the amended complaint, alleges:

(1) Defendant admits that Stentor Electric Manufacturing Company, Inc. was incorporated under the laws of the State of New York on or about May 20, 1913 under its then name of Electrical Experiment Company, Inc., which said name was, on or about May 22, 1914, changed to Stentor Electric Manufacturing Company, Inc. Defendant is without knowledge or information sufficient to

form a belief as to the averments that said corporation was "duly organized" under the laws of the State of New York or that said corporation was sometimes known as Stentor Electric Manufacturing Company.

(2) Defendant admits that on or about May 26, 1919, said Stentor Electric Manufacturing Company, Inc. was dissolved. Defendant is without knowledge or information sufficient to form a belief as to the truth of the averments that said dissolution was effected "voluntarily" and "in accordance with the Statutes of the State of New York"; or whether at the time of its said dissolution Buell Hollister, Jesse L. Spence and Charles E. Danforth were all of the directors of said corporation or whether said corporation was sometimes known as Stentor Electric Manufacturing Company.

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(3) Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph (3) of the amended complaint.

(4) Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph (4) of the amended complaint.

(5) Defendant admits the allegations of Paragraph (5) of the amended complaint.

(6) Defendant denies each and every allegation of Paragraph (6) of the amended complaint, except defendant admits that the damages claimed by plaintiff in its amended complaint exceed, exclusive of interest and costs, the sum of Three Thousand Dollars ($3,000.00), but defendant denies that the plaintiff is entitled to recover herein any amount whatsoever against the defendant.

(7) Defendant admits that on or about the Twentieth day of May, 1918, an instrument of writing was partially signed by the defendant and by the remaining party thereto designated therein as Stentor Electric Manufacturing Company, which said remaining party, in the body of said instrument of writing, is referred to as the "Stentor Company" and that the purported copy of the said instrument of writing bearing date the Twentieth day of May, 1918, and attached to the amended complaint as Exhibit A, differs in several particulars from the instrument of writing partially signed by the defendant on,

or as of, the Twentieth day of May, 1918. Defendant is without knowledge or information sufficient to form a belief as to whether or not Stentor Electric Manufacturing Company, Inc. was sometimes known as Stentor Electric Manufacturing Company. Except as hereinbefore admitted or explained, defendant denies each and every allegation of Paragraph (7) of the amended complaint.

(8) Defendant denies each and every allegation of Paragraph (8) of the amended complaint, except that defendant admits that Article Second of said instrument of writing provides as follows:

> "Article Second: The Stentor Company agrees to grant and hereby does grant, license and transfer to the Klaxon Company for the term of this agreement, but subject to its conditions, the sole and exclusive right to make, have made, use and sell telephone and related apparatus and devices and articles made in accordance with the United States Letters Patent, and applications for patents described on Schedule 'A' hereto annexed, or any subsequent improvements thereon which may be made, acquired, owned or controlled by the said Stentor Company upon the inventions or any of

them, described in said Letters Patent or applications.

"The Stentor Company further agrees that it will grant a similar license to manufacture the said inventions, improvements and devices under any patent which has been or which may be issued to it by any foreign state or country."

(9) Defendant denies that many of the following apparatus, to-wit, automobile or chauffeur telephones; marine telephones; fire control telephones for ships; railroad dispatching systems and announcing systems; office inter-

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communicating systems; apartment house or vestibule telephones; paging systems; tank telephones; aeroplane telephones; mine telephones; power transmission line telephones; loud speakers and loud speaking announcers; cigar lighters and an improved helmet for aviators, made in accordance with United States Letters Patent and applications for Letters Patent set forth in Schedule "B" annexed to the aforesaid instrument of writing, or in accordance with improvements thereon, were manufactured and sold by plaintiff herein at and before the making of the said instrument of writing; that many of said apparatus were or could be put in use during the term of the instrument of writing in suit, and that the manufacture and sale thereof were commercially profitable and would continue to become profitable.

(10) Answering Paragraph (10) of the amended complaint, defendant denies each and every allegation thereof, except that it admits that Article Third of said instrument of writing provided as follows:

"Article Third: The Stentor Company agrees that this license will remain in full force and effect, if not sooner cancelled or terminated as herein

provided, for the term of seventeen years from September 29, 1914, except that the said Stentor Company may, at any time within two years of the expiration of the date of the above-described patents, engaged in the manufacture of the apparatus described therein and covered thereby; and the Stentor Company agrees that it will not, prior to said two years period, directly or indirectly engage in the manufacture or sale of articles, apparatus or improvements covered thereby, and that if within such period of two years it shall commence such manufacture its right to receive royalties hereunder shall thereupon terminate."

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(11) Answering Paragraph (11) of the amended complaint, defendant denies each and every allegation thereof, but admits that Article Eleventh of the said instrument of writing dated May 20, 1918 provided as follows:

"Article Eleventh: The Klaxon Company agrees to pay to the Stentor Company, as royalties hereunder, an amount equal to fifty per cent (50%) of the net profits realized by it from the sale of articles manufactured and sold under the patents licensed hereunder, provided, however, that if the said net profits are not equal to thirty per cent (30%) of the cost of manufacture, as herein defined, the Klaxon Company shall be entitled to retain all of said profits up to fifteen per cent (15%) of such cost of manufacture. Net profits in addition to the said thirty per cent (30%) shall be divided equally between the parties hereto. In all cases where inventions or improvements which are the subject of this agreement are incorporated with other devices or apparatus so as to form a single article, which is the subject of sale, then the whole-

sale selling price at which said other devices or apparatus not covered by this agreement are sold to Klaxon's other trade in general, shall be deducted from net sales price received for the complete article before determining net profits for distribution under this agreement."

(12) Answering Paragraph (12) of the amended complaint, defendant denies each and every allegation thereof, except that defendant admits that the instrument of writing dated May 20, 1918 provided, *inter alia*, as follows:

"Article Thirteenth: The Klaxon Company shall furnish to the Stentor Company monthly statements of all business done by the Klaxon Company affected by this contract and will use its best efforts to further the manufacture and sale of the articles covered by this agreement, and to that end it will maintain an efficient organization for the manufacture and sale of said articles. It also agrees to maintain suitable accounts and records to which the Stentor Company shall have access, showing

the cost of manufacture and the net profits, and in the event of any difference as to the proper amount of said profits, the determination thereof shall, in the event of disagreement, within the provisions of this agreement, be made by Messrs. Haskins & Sells, certified public accountants of the City of New York, whose decision thereon shall be final and binding upon the parties hereto.

"Article Twenty-second: During the term of this agreement and any extension hereof, the Klaxon Company agrees not to itself manufacture or sell, nor manufacture or sell for any other party, any article, device or apparatus which would be com-

petitive with or a substitute for any article, device or apparatus covered by this agreement without the written consent of the Stentor Company first had and obtained."

(13) Answering Paragraph (13) of the amended complaint, defendant denies each and every allegation thereof except that the defandant admits that it, the defendant, was from the time of the making of said instrument of writing dated May 20, 1918, until on or about a year thereafter, possessed of whatever rights, if any, that were conferred upon the defendant by said instrument of writing.

(14) Answering Paragraph (14) of the amended complaint, defendant denies each and every allegation thereof except that defendant admits that the instrument of writing dated May 20, 1918 aforesaid was not expressly cancelled or terminated in all its parts prior to September 29, 1931 by any written agreement between the parties to said instrument of writing.

(15) Defendant denies, upon information and belief, each and every allegation of Paragraph (15) of the amended complaint.

(16) Answering Paragraph (16) of the amended complaint, if it be the fact that the plaintiff herein was party to said instrument of writing dated May 20, 1918, defendant denies, upon information and belief, that said plaintiff has always, since May 20, 1918, well and truly performed, fulfilled and kept all things in the said instrument of writing contained on its part and behalf to be performed, fulfilled and kept according to the tenor and effect, true intent and meaning of the said instrument of writing.

Answer to Complaint as Amended.

(17) Defendant denies each and every allegation of Paragraph (17) of the amended complaint, except that defendant admits and alleges that as of July 1, 1924 it transferred, assigned, set over and delivered unto General Motors Corporation, the sole stockholder of defendant, substantially all of defendant's assets, including its factory, and factory premises, and coincident therewith, General Motors Corporation assumed all of the liabilities, if any, and all the obligations of defendant, including the obligations, if any arising under, out of, or in connection with the aforesaid instrument of writing of May 20, 1918; that thereafter defendant did not itself manufacture any devices referred to in said instrument of writing of May 20, 1918 and did not itself thereafter maintain any organization for the manufacture of said articles; but the other party to said instrument of writing of May 20, 1918 acquiesced in said transfer to General Motors Corporation, and in such discontinuance of the

manufacture of said articles by defendant itself, and in the termination as aforesaid by defendant itself of its organization for the manufacture and sale of said articles; that after the aforesaid transfer by defendant to General Motors Corporation and the assumption by the latter corporation of the aforesaid liabilities and obligations of defendant, the other party to the said instrument of writing of May 20, 1918 looked to and accepted the aforesaid undertaking and obligation of General Motors Corporation, in lieu and discharge of the obligations and liabilities, if any, of defendant theretofore existing under said instrument of writing of May 20, 1918.

Defendant further alleges that notwithstanding it used its best efforts to further the manufacture and sale of the articles of the instrument of writing of May 20, 1918, nevertheless, by reason of the great extent to which the fields occupied by the patents enumerated in Schedule A

to the instrument of writing of May 20, 1918 were limited and confined by the patents and publications of the prior art and by prior knowledge and use of the same, or like articles, and by reason of the fact that the end of the war greatly lessened the demand for such or like articles in many fields, and by reason of the faults inherent in the structure or principle of some or all of said articles, and by reason of their functioning in a manner which would not produce the desired results, and because said articles fell into disuse by being supplanted in their several fields by other and different devices, the efforts

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of defendant were largely unavailing and fruitless. As a consequence, defendant concentrated its efforts on the manufacture and sale of those articles of the instrument of writing which, after changes in their structure, functioning and principle or mode of operation, possessed some utility. Such articles included telephone transmitters and receivers for automobile telephones, then used mainly in limousines. As the demand for and sale of limousines became less and less, the demand for automobile telephones likewise diminished. After July 1, 1924, General Motors Corporation, its subsidiaries or affiliates, continued in the light of the experience of defendant and the conditions existing after July 1, 1924 with respect to the subject-matters of the said patents Nos. 1,112,392, 1,112,167, 1,235,851 and 1,235,853, to concentrate its efforts upon the manufacture and sale of automobile telephones. But by reason of the inherent defects in the structure and principle of operation of the telephone transmitter and receiver of patents 1,112,392, 1,112,167, and the helmet of patent No. 1,235,851 and the inability of said devices, and each of them, to function, without alteration in structure, to produce a result acceptable to the buying public, and by reason of the appearance upon the market of cigar lighters differing in form, structure and mode of

operation from those of patent No. 1,235,853, the efforts of General Motors Corporation to further the manufacture and sale of the articles covered by said instrument of writing could be successfully carried out only with respect

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to automobile telephones, and even in that field only to a diminishing extent, as the automobiles in which such apparatus was installed became fewer and fewer. Royalties were paid by defendant and by General Motors Corporation, or its affiliates, to the other party to said instrument of writing of May 20, 1918, for all devices made and sold by them, or any of them, of the general character of the devices of the said Letters Patent, notwithstanding the devices so made and sold were of necessity different in structure and principle of operation from the devices of said patents.

Defendant further alleges that it has at all times fully carried out, kept and performed all the terms, conditions and provisions of Articles Thirteenth, Eighteenth and Twenty-second of said instrument of writing of May 20, 1918, and all other Articles of said instrument of writing, according to the true intent and meaning thereof.

(18) Defendant denies each and every allegation of Paragraph (18) of the amended complaint.

(19) Defendant denies each and every allegation of Paragraph (19) of the amended complaint, except that defendant repeats and realleges each and every allegation contained in Paragraph (17) of the Answer herein with the same force and effect as if herein specifically set forth at length.

(20) Defendant denies each and every allegation of Paragraph (20) of the amended complaint.

LASTLY, the defendant denies all matters alleged in the amended complaint which have not been herein expressly answered.

AS AND FOR SEPARATE AND DISTINCT DEFENSES TO THE AMENDED COMPLAINT DEFENDANT ALLEGES:

FIRST DEFENSE

The complaint fails to state a claim against defendant upon which relief can be granted.

SECOND DEFENSE

Upon information and belief, that Stentor Electric Manufacturing Company, Inc. is not the corporation which was a party to the instrument of writing bearing date May 20, 1918 hereinbefore referred to.

THIRD DEFENSE

That the instrument of writing dated May 20, 1918 was not in fact signed by Stentor Electric Manufacturing Company, Inc. nor was it sealed by Stentor Electric Manufacturing Company. Wherefore said instrument of writing never became or was of any legal effect.

FOURTH DEFENSE

The seal, if any, affixed to the said instrument of writing dated May 20, 1918, purporting to be the seal of Stentor Electric Manufacturing Company, a corporation of the State of New York, was not the corporate seal thereof.

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FIFTH DEFENSE

The instrument of writing sued upon was not in legal contemplation a sealed instrument. The right or rights of action set forth in the amended complaint did not accrue, nor did any part or parts thereof accrue, within three years before the commencement of this action.

SIXTH DEFENSE

If the said instrument of writing of May 20, 1918, was originally a sealed instrument, nevertheless it was, in the year 1918, modified by writings not under seal, and was thereby deprived of its character as a specialty and converted into an unsealed instrument of writing or simple contract. The right or rights of action set forth in the complaint did not accrue, nor did any part or parts thereof accrue, within three years before the commencement of this action.

SEVENTH DEFENSE

That the alleged cause of action set forth in Paragraph (18) of the amended complaint was first alleged by plaintiff herein in the amended complaint filed on March 13, 1939, and that said alleged right of action did not accrue within three years prior to the said 13th day of March, 1939.

EIGHTH DEFENSE

Plaintiff neglected and omitted seasonably to assert the rights of action against the defendant alleged in the com-

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plaint herein and asserted such right or rights of action only after plaintiff herein, by its acts and silence, had acquiesced in defendant's acts now complained of. By

reason of such acts of omission and commission on the part of plaintiff, defendant is now deprive of the benefit of the testimony of many witnesses who are now deceased and of the benefit of any books, papers, records and documents which have been mislaid, lost or destroyed.

NINTH DEFENSE

The instrument of writing bearing date of May 20, 1918, between this defendant and Stentor Electric Manufacturing Company, a corporation of New York, referred to in said instrument of writing after the first paragraph thereof as the "Stentor Company", recited that the said Stentor Company is the sole owner of various United States Letters Patent and applications relating to telephones and similar apparatus, a schedule whereof is annexed to said instrument of writing, marked "A" and made a part thereof. Said schedule enumerates United States Letters Patent Nos. 1,112,392, 1,112,167, 1,235,851 and 1,235,853. Defendant alleges, on information and belief, that the said alleged Stentor Electric Manufacturing Company, a corporation of New York, party to said instrument of writing, was not at the time of the making and execution of said instrument of writing or at any time thereafter, the owner of said Letters Patent or any thereof. Wherefore, said recital in said instrument of writing contained, constituted a misrepresentation of material fact.

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TENTH DEFENSE

The instrument of writing bearing date May 20, 1918, between this defendant and Stentor Electric Manufacturing Company, a corporation of New York, (in said instrument of writing called the "Stentor Company"), recited

that the said Stentor Company is the sole owner of various United States Letters Patent and applications relating to telephone and similar apparatus a schedule whereof was annexed to said instrument marked "A" and made part thereof, the patents of said schedule being United States Letters Patent Nos. 1,112,392, 1,112,167, 1,235,851 and 1,235,853. In and by Article Second of said instrument of writing it was provided as follows:

> "ARTICLE SECOND: The Stentor Company agrees to grant and hereby does grant, license and transfer to the Klaxon Company for the term of this agreement, but subject to its conditions, the sole and exclusive right to make, have made, use and sell telephone and related apparatus and devices and articles made in accordance with the United States Letters Patent, and applications for patents described on Schedule 'A' hereto annexed, or any subsequent improvements thereon which may be made, acquired, owned or controlled by the said Stentor Company upon the inventions or any of them, described in said Letters Patent or applications.
>
> "The Stentor Company further agrees that it will grant a similar license to manufacture the said inventions, improvements and devices under any patent which has been or which may be issued to it by any foreign state or country."

Upon information and belief, defendant alleges that Stentor Electric Manufacturing Company, a corporation of New York, was not at the time of the execution of said instrument of writing or at any time thereafter, the

owner of said Letters Patent or any thereof. Wherefore, said instrument of writing is without consideration and is void.

ELEVENTH DEFENSE

Upon information and belief, that the instrument of writing of May 20, 1918 constituted an assignment to defendant of all the right, title and interest, if any, of the other party to said instrument of writing, in and to the patents therein referred to, as distinct from a mere license thereunder; that said patents are and at all times have been, and each of them is, wholly invalid and void; and that by reason thereof said instrument of writing and the covenants of the parties thereto are without consideration and are void and unenforceable.

TWELFTH DEFENSE

Upon information and belief, that the instrument of writing of May 20, 1918, was made in the State of New York and constituted an assignment to defendant of all the right, title and interest, if any, of the other party to said instrument of writing, in and to the patents therein referred to, as distinct from a mere license thereunder; that said patents are and at all time have been, and each of them is, wholly invalid and void; and that by reason thereof said instrument of writing and the covenants of the parties thereto are without consideration and are void and unenforceable.

THIRTEENTH DEFENSE

That if said patents or some of them are valid, the inventions of the claims thereof are so narrow and limited in their scope that the patents were of no practical or commercial value. Wherefore said agreement, and the covenants of the parties thereto, were and are without consideration and were and are void and unenforceable.

Answer to Complaint as Amended.

FOURTEENTH DEFENSE

That on or about July 1, 1924, it transferred and assigned to General Motors Corporation, defendant's sole stockholder, substantially all of its assets, and in connection therewith General Motors Corporation assumed all the liabilities and obligations of the defendant, including all of the obligations under said instrument of writing of May 20, 1918. This fact was made known to the other party to said instrument of writing dated May 20, 1918 promptly after said transfer. At all times thereafter the other party to said instrument of writing acquiesced in the transfer and accepted performance under the undertaking or agreement of General Motors Corporation and its affiliated companies, other than the defendant, in lieu of performance of defendant under the instrument of writing of May 20, 1918, and otherwise acted under the arrangement, so that a novation was effected under and by which the other party to said instrument of writing accepted the said undertaking of General Motors Corporation in lieu of the obligations of the defendant under

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said instrument of writing of May 20, 1918. Wherefore, defendant has been released and relieved from all liability under said instrument of writing, if any, which might otherwise exist.

FIFTEENTH DEFENSE

That if the aforesaid instrument of writing of May 20, 1918 constituted a contract between the parties thereto, and if, under the strict terms thereof, defendant was originally obligated to use efforts and perform acts in addition to or different from those which it did use and perform, and if plaintiff herein has any rights in, to or under said instrument of writing, nevertheless, plaintiff

is without any right of action based upon any alleged failure of defendant to use efforts or perform acts other than those used and performed by it in that the efforts used by defendant and the acts performed by it have been acquiesced in and accepted by the other parties in interest under said instrument of writing as full performance thereof and thereunder. Wherefore, plaintiff and all others claiming any interest under said instrument of writing have waived any right they otherwise might have to assert that any of the covenants and conditions of said instrument of writing have not been fully performed and kept by defendant in accordance with the true meaning and intent thereof, are now barred and estopped from so doing.

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SIXTEENTH DEFENSE

That the instrument of writing of May 20, 1918 is now and at all times heretofore has been without any binding force or effect upon defendant in that defendant was induced to become a party to said instrument of writing by reason of the fraud of the other party thereto; that said fraud consisted, in part, of representations made to defendant by the other party to said instrument of writing that the United States Letters Patent Nos. 1,112,392, 1,112,167, 1,235,851 and 1,235,853 were good and valid in law and that the devices purporting to be covered thereby were of great utility and efficiency and constituted a substantial advance over like devices of the same general character of the prior art; that orders therefor or for some thereof were being received by the other party to said instrument of writing from the United States Navy without solicitation or selling; that the business of the other party to the said instrument of writing consisted of the manufacture and sale of the devices purporting

to be covered by the aforesaid Letters Patent, or some of them, and had been conducted at a substantial profit, whereas, in truth and in fact, the said Letters Patent, defendant is informed and believes and therefore alleges, were and at all times have been, invalid in law; that the devices purporting to be covered by said Letters Patent do not constitute an advance or improvement over de-

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vices of the same general character of the prior art; that on the contrary the said devices instead of constituting an advance over the devices of the same general character of the prior art, are based upon principles that are unsound and deprive the devices of said patents of practical utility, and the business of the other party to said instrument of writing had been conducted not at a profit but, on the contrary, at a very substantial loss.

SEVENTEENTH DEFENSE

That there was a failure of consideration for the instrument of writing of May 20, 1918, in that no patents were ever issued under the applications set forth in Schedule A annexed to said instrument of writing.

EIGHTEENTH DEFENSE

Defendant alleges that it was contemplated and understood by and between the respective parties to the instrument of writing dated the 20th day of May, 1918, that said instrument of writing should not have any binding force or effect unless and until the same should be not only signed by the chief executive officers of the respective parties but also not until the corporate seals of the respective corporations should be affixed thereto, and duly attested by the respective secretaries of the parties to said instrument of writing; that upon information and

belief, defendant alleges that the said instrument of writing was never executed as contemplated by the parties

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in that the seal of Stentor Electric Manufacturing Company, a corporation of the State of New York, was never affixed to the said instrument of writing and that the seal, if any, affixed to said instrument of writing purporting to be the seal of the said Stentor Electric Manufacturing Company, was not the seal thereof, and that the seal of neither party to said instrument of writing was duly attested by the respective secretaries of said parties at the time of its signing.

NINETEENTH DEFENSE

The defendant, General Motors Corporation, its subsidiaries or affiliates, before the commencement of this suit, from time to time, have paid the other party to said instrument of writing dated May 20, 1918, various sums of money in full satisfaction and discharge of all liability, if any, of the defendant thereunder, to and including March 31, 1928, and of all damages, if any, by the other party to said instrument of writing sustained, to and including March 31, 1928, by reason of defendant's alleged breach thereof, which said sums of money the other party to said instrument of writing then and there accepted and received of and from the said defendant, General Motors Corporation, its subsidiaries or affiliates, in full satisfaction and discharge of all liability, if any, of the defendant thereunder, to and including March 31, 1928, and of all damages, if any, which the other party

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to said instrument of writing sustained, to and including March 31, 1928, by reason of defendant's alleged breach thereof.

TWENTIETH DEFENSE

The terms of Article Thirteenth of said instrument of writing dated May 20, 1918, and the purported obligations of the defendant thereunder, are so vague, indefinite and uncertain as to be invalid and unenforceable.

AS AND FOR FURTHER SEPARATE AND DISTINCT PARTIAL DEFENSES TO THE AMENDED COMPLAINT:

Defendant repeats and realleges all and singular of the matters contained in the foregoing Paragraphs hereof pertaining to all of the Separate and Distinct Defenses, except the First thereof.

WHEREFORE, the defendant denies that the plaintiff is entitled to the relief prayed for, or any relief, and defendant prays that it may hence be dismissed with its costs and charges in this cause sustained.

KLAXON COMPANY
By (Sgd.) HUGH M. MORRIS
(Sgd.) EDWIN D. STEEL, JR.
Its Attorneys

Dated: June 28, 1939

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Motion of Defendant for Directed Verdict.

(Filed July 17, 1939.)

Now comes Klaxon Company, defendant in the above cause, by its attorneys, Hugh M. Morris, Esq., and E. D. Steel, Jr., Esq., and moves the Court that the jury be

directed to return a verdict in its favor, for the following reasons:

(1) Even though it be assumed, contrary to defendant's contention, that it breached Article XIII of the contract of May 20, 1918, as a matter of law, the most that the plaintiff is entitled to recover is nominal damages in the amount of Six Cents (6¢), which is less than the minimum amount of Three Thousand Dollars ($3,000.00) which is essential to confer jurisdiction upon this Court.

(2) The practical construction which the parties themselves have placed upon the agreement of May 20, 1918, conclusively demonstrates that it was not the intention of either of the parties to the agreement that the defendant should be obligated to enter the radio field and, hence, no liability can attach for its failure to do so.

(3) The plaintiff has failed to prove that the Stentor Electric Manufacturing Company, Inc., the plaintiff in the case, is the same corporation as the Stentor Electric Manufacturing Company whose name appears upon the agreement of May 20, 1918.

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(4) As a result of the transfer by the Klaxon Company of substantially all of its assets, as of July 1, 1924, to General Motors Corporation, and the acts and conduct of the parties thereafter, a novation was effected, under and by which the undertaking of General Motors Corporation was accepted in lieu of the obligations of the defendant under the agreement of May 20, 1918, and the defendant was released and relieved from all of its liability thereunder.

(5) The defendant, General Motors Corporation, its subsidiaries or affiliates, from time to time have paid to

Stentor various sums of money in full satisfaction and discharge of all liability, if any, of the defendant under the agreement in suit, to and including March 31, 1928, and of all damages, if any, which Stentor has sustained to and including March 31, 1928, by reason of defendant's alleged breach thereof. The plaintiff has offered no proof with respect to damages which it alleges that it sustained for the period April 1, 1928, to June 1, 1929, when the suit was commenced.

(Sgd.) HUGH M. MORRIS,
(Sgd.) EDWIN D. STEEL, JR.,
Attorneys for Klaxon Company.

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Judgment.

(Entered July 20, 1939.)

And now, to wit, this twentieth day of July, A. D. 1939, it is considered and adjudged by the Court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of one hundred thousand dollars ($100,000.00) and its costs in and about this suit expended, and have execution therefor.

Attest: H. C. MAHAFFY, JR.,
Clerk.

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Motion That Judgment be Corrected to Include Interest.

(Filed July 26, 1939.)

COMES NOW, Stentor Electric Manufacturing Company, Inc., the plaintiff above named, and moves the Court that the judgment entered in this cause on July 20, 1939, be corrected so as to include interest thereon from the date of the institution of suit herein, to wit, June 1, 1929, to the date of the entry of said judgment, pursuant to the statutes of the State of New York (§480 of the Civil Practice Act of the State of New York), in the following manner and form, to wit:

> "AND NOW, to-wit, this 20th day of July, A. D. 1939, it is considered and adjudged by the Court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of One hundred thousand Dollars ($100,000.00), together with interest on said sum at the rate of six per cent per annum from June 1, 1929 to July 20, 1939, namely, the sum of Sixty thousand eight hundred twenty-one Dollars and ninety-two Cents ($60,821.92), and its costs in and about this suit expended and for execution therefor.
>
> Attest:
>
> Clerk."

(Sgd.) PAUL LEAHY,
Attorney for Plaintiff.

Dated: July 26, 1939.

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Opinion of Court Denying New Trial and Adding Interest to Verdict.

(Filed November 28, 1939.)

A verdict for $100,000 was rendered in favor of the plaintiff and judgment entered thereon.

Defendant moves: (1) To have the verdict and judgment set aside; (2) to have judgment entered for defendant; or (3) a new trial granted.

Plaintiff moves that the judgment be corrected to include interest on the amount of the verdict at the rate of 6% per annum, from the date of the institution of suit to the date of the entry of judgment, in the sum of $60,821.92.

The grounds of defendant's motions are:

1. That the complaint sets forth no cause of action, in that, article 13 is too vague and indefinite to be enforceable. The article provides that the defendant "will use its best efforts to further the manufacture and sale of the articles covered by this agreement, and to that end it will maintain an efficient organization for the manufacture and sale of said articles".

2. That upon the breach of such a license agreement as the one in suit, it must be ruled as a matter of law either that no money damages at all are recoverable or that the recovery must be limited to the nominal sum of six cents.

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3. That the proof of commercial utility of the articles covered by the agreement does not support a verdict in favor of the plaintiff.

4. That the court erred in refusing to instruct the jury as prayed by the defendant in its 27th prayer as follows:

> "27. The Spence receiver patent conferred no authority upon the defendant to manufacture the cone or dynamic type of radio receiver. This is true, even though it be assumed that the words of the claims of the Spence receiver patent read upon the diaphragm and mounting of the cone or dynamic type receiver."

5. That the court erred in charging the jury as follows:

> "It is for the jury to determine whether or no the patents were limited to the devices specified therein and whether the patents so limited were of any commercial value."

6. That it was error for the court to grant plaintiff inspection of Prickett Exhibits Nos. 300 to 1087.

7. That the testimony of Hollister upon a subject defendant opened over plaintiff's objections should not have been received.

8. That the verdict was excessive.

The scope of a motion to set aside a verdict or for a new trial has been repeatedly dealt with. This court held:

> "It is not, however, a sufficient ground for a new trial that the verdict is merely against a preponderance of the testimony, or that the court might have arrived at a different result, but the verdict must be manifestly and palpably against the evidence in

the case." *Weed* v. *Lyons Petroleum Co.*, 294 Fed. 725, 733; affirmed 300 Fed. 1005.

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Such a motion based upon the alleged excessive amount of the verdict has been frequently considered:

> "Conceding that the amount of the verdict is larger than the court would have given if the cause had been tried by it without a jury, this fact alone ought not to induce the court to grant a new trial. The matter of assessing the damages is, in cases of this character, exclusively within the province of the jury to determine, and the court should never interfere with the verdict, unless the amount is so excessive as to indicate passion and prejudice on the part on the jury, and cannot be accounted for in any other manner." *Occidental Consolidated Min. Co.* v. *Comstock Tunnel Co.*, 125 Fed. 244.

The court in charging the jury in this case adopted language usually employed in this district:

> "You will understand that you are not bound by anything that the court has said regarding the facts. The jury is bound in the performance of its duty to follow the law laid down by the court. As to the facts, you are entirely free to find, as you see fit, in accordance with the principles of law given you by the court. In mentioning facts the sole purpose of the court is to assist the jury but not to usurp or attempt to usurp the power belonging to them."

Defendant's grounds for setting aside the verdict will be considered seriatim.

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The court reaffirms its charge to the jury that the complaint clearly states a cause of action.

Defendant does not claim as a matter of law that damages for loss of profits are never recoverable. In its brief defendant states: "* * * since *Hadley* v. *Baxendale*, 9 Ex. 341 (1854), or even earlier in *Masterton* v. *Mayor of Brooklyn*, 7 Hill 61 (N. Y. 1845), loss of profits which were the direct and immediate fruits of the contract have been allowed". In this connection defendant states: "One

is struck upon reading the cases by the unanimity of decision since 1845 to the effect that anticipated profits may be a proper element of damages, but that in certain cases susceptible of definite classification, anticipated profits are so inherently uncertain that their recovery will be denied."

Defendant contends that this case is controlled by the rule that anticipated profits of a new and untried business may not be recovered as damages for breach of contract. *Cramer* v. *Grand Rapids Showcase Co.*, 223 N. Y. 63. The business of plaintiff was not "a new and untried business". Plaintiff was organized in 1913. During the early and experimental years it made no profits. In 1917 after charging off taxes, salaries and depreciation it showed a net profit. When the license agreement was made, plaintiff delivered to defendant contracts aggregating $240,000 upon which defendant realized a net profit. In subsequent years profits were realized from a business of nearly $1,000,000 without any promotion or exploitation into new fields. Here, a going business was turned over to defendant upon a profit sharing basis and upon defendant's undertaking to use its best efforts "to further the manufacture and sale of the articles covered by this agreement".

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Defendant further contends that license agreements with respect to patent devices are sui generis. This argument is based upon the language of the District Court in *Crowe* v. *Oscar Barnett Foundry Co.*, 213 F. 864. But the Court of Appeals in that case clearly recognized that there is

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nothing sui generis in a license agreement for a patented device prohibiting the recovery of damages for breach thereof.

Defendant contends that damages were not proved by sufficient and competent evidence. There was evidence of the profits earned by plaintiff in 1917 from which damages could be computed. This profit was $13,210.13. Upon that basis the net profit payable to plaintiff for the fourteen years of the license agreement would be $184,800. Defendant received from Klaxon during that period $70,000. The difference is $114,300 or $14,800 more than the verdict.

Hollister, plaintiff's witness, computed damages for the years 1928 to 1930 inclusive, in the sum of $23,424.84 on the basis of the loss suffered by plaintiff because of defendant's policy of favoring Fisher Body and Fleetwood, affiliates of General Motors. Adding this damage to the first amount, you have damages of $138,200 or $38,200 more than the verdict.

Profits for the seven and one-half months from May 20, 1918 to December 31, 1918 were $61,000. One-half of this amount or $30,500 was paid to plaintiff. At that rate for the thirteen remaining years of the license agreement profits would have been paid to plaintiff of $396,000. Klaxon actually received only $40,000 leaving a difference of $356,000. Moreover, plaintiff's witness Hollister testified that plaintiff would have received a very substantial sum as its share of profits if defendant had not ignored the radio market during the years 1922 to 1927.

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There was also evidence before the jury that the Spence receivers cost from $.95 to $1.10 and that defendant received on the outside as high as $3.70 per receiver and from Fisher Body and Fleetwood $2.25 to $2.50. A profit to plaintiff of $1.00 per receiver could be readily calculated.

In 1918 Alfred P. Sloan, Jr., was president of United Motors Corporation and in 1929 was Chairman of the board of directors of General Motors Corporation. His deposition read in evidence by defendant contains the following passages:

> "Q. Without regard to the details you ultimately did recommend the making of this agreement? [meaning the license agreement in suit]. A. Yes.
>
> Q. And the fact is that you recommended it because at that time you thought the making of this agreement would be a desirable piece of business for the United Motors, or such affiliate or subsidiary which made the agreement? A. Absolutely, or I would not have recommended it.
>
> * * * * * * *
>
> Q. The agreement itself as you have pointed out is an agreement in effect for the sharing of profits? A. Yes.
>
> Q. Consequently I assume that the record of profits, if any, of the Stentor Company up to that time, and the possibility of profits in that operation after that time, were matters of prime interest to you? A. I must have gone into it at the time, otherwise I would not have been justified in making the recommendation. The question now is, do I recall; and the answer is, no.
>
> Q. But you feel certain you must have gone into it? A. Yes, it was part of my responsibility.

Q. And you satisfied yourself both with respect

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to profits up to that time, and the possibility of profits, which could have been foreseen in the future? A. Otherwise I would not have recommended it."

Mathematical exactness is not required in computing damages:

"As to this question the Court of Appeals—after stating that in its opinion the plaintiff's evidence would have supported a much larger verdict than that returned by the jury—said: 'The plaintiff had an established business, and the future profits could be shown by past experience. It was permissible to arrive at net profits by deducting from the gross profits of an earlier period an estimated expense of doing business. Damages are not rendered uncertain because they cannot be calculated with absolute exactness. It is sufficient if a reasonable basis of computation is afforded, although the result be only approximate.' This, we think, was a correct statement of the applicable rules of law. Furthermore, a defendant whose wrongful conduct has rendered difficult the ascertainment of the precise damages suffered by the plaintiff, is not entitled to complain that they cannot be measured with the same exactness and precision as would otherwise be possible." *Eastman Co.* v. *Southern Photo Co.*, 273 U. S. 359, 378.

With respect to computing damages the court charged the jury substantially as prayed for in defendant's prayer No. 15. The court further charged:

"In considering damages you are entitled to take into consideration the merits and commercial sal-

ability of the Spence receiver and transmitter; the markets which existed for those products from May 20, 1918 to December 29, 1931; the prices at which such products could have been manufactured and sold and the profit thereon; the competition in the market of similar products offered for sale by other manufacturers and sellers; and the ability of the defendant to compete in the markets."

There was evidence before the jury of each item referred to in the charge.

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On the question of commercial utility defendant contended that it did not manufacture under the Spence patents and that products manufactured thereunder would not work. The testimony of Mr. Sloan, already quoted, is a sufficient answer to this contention. He testified that he had satisfied himself of the value of the Stentor device. There was evidence before the jury that from May 20, 1918 to September 14, 1931 defendant manufactured a million dollars' worth of business in this product stamped and sold as manufactured under the Spence patents. Defendant represented in its publications that the product was manufactured under the Spence patents. In 1919 defendant issued a pamphlet "Klaxon-Stentor Autophone" containing the following representations:

"With the Autophone there is an efficient transmittal when the street is noisy, the windows open and conversation going on in the car. The patented, exclusive diaphragm of the KLAXON-Stentor Autophone makes this possible. * * * As the speaker takes the transmitter in hand, the thumb automatically presses a small button in the handle. That is all; and then talks in a normal, easy, con-

> versational tone to the driver. It is not necessary to use any special tone of voice. The KLAXON-Stentor Autophone reproduces any tone of the voice from a whisper to a shout and carries the message distinctly to the ears of the driver. * * * The unfailing guarantee of the KLAXON Company backs every statement made in this writing, and insures the instrument against any defect in material or workmanship."

The value of the Spence devices in outside fields was properly presented to the jury, particularly their value in circuits employing the amplifying tube and in radio sets. There was proof that the receiver was the same no matter to what use it was put. Disinterested witnesses testified that the Spence receiver worked as well or better

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than competing receivers then on the market in circuits employing the amplifying tube or in ordinary telephone circuits and that the Spence receiver was as good as any other receiver on the market for use in radio. It should be noted that these disinterested witnesses were actually engaged in the manufacture, assembly and testing of the device. With many persons engaged in the manufacture and sale of these patented devices for a number of years with intimate knowledge of their character, it is very significant that defendant failed to call such witnesses to testify that the patented devices lacked commercial utility.

Defendant's experts, Karapetoff and Kelley, had never heard the Stentor product in operation. Their testimony was to the effect that the Stentor device would not work in any mechanism. Yet they were faced with the evidence

that defendant had sold $1,000,000 worth of these devices through the years.

> "The value of expert testimony generally depends upon the facts stated as a reason for their opinions and conclusions. * * * More weight is given to the testimony of a witness based upon facts within his own knowledge and experience than to the testimony of a witness which is 'largely the assertion of a theory'." *Overweight C. Elevator Co.* v. *Improved Order R. M. H. Ass'n.*, 94 F. 155, 161.

That the court refused to charge the jury as prayed in defendant's 27th prayer is assigned as error. That prayer was:

> "27. The Spence receiver patent conferred no authority upon the defendant to manufacture the cone or dynamic type of radio receiver. This is true, even though it be assumed that the words of the claims of the Spence receiver patent read upon the diaphragm and mounting of the cone or dynamic type receiver."

Of course, a patent grants no right to manufacture. It is solely a grant of a right to exclude all others from making, using or selling the invention covered by it. It was improper for the court to charge the jury as requested in defendant's 27th prayer.

It was understood that the Stentor receiver was an ordinary telephone receiver with a special form of diaphragm and diaphragm setting and mounting. Defendant's expert Kelley testified:

> "Q. Well, then, his patent if any, or his inven-

tion, if any there was, lies where? A. It lies in a thick diaphragm between air cushions which are not tightly clamped."

Defendant complains of the court's failure to charge upon the scope of the Spence patents. Defendant's prayers contained no request for such a charge. The court, however, instructed the jury as to the scope of the Spence patents:

"Before you can find that the defendant did not use its best efforts to further the manufacture and sale of the articles covered by the agreement of May 20, 1918 and that it did not maintain an efficient organization for the manufacture and sale of such articles, you must first find that the articles covered by the patents possessed commercial value and utility sufficient to justify their manufacture and sale. The defendant was not obliged under its agreement to manufacture and sell the articles covered by the patents for use in the radio or other fields unless the patented articles were suitable and practical for use in those fields.

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You may recall, that defendant's expert Kelley testified that in the telephone art, before and after 1918, it was universally recognized that a diaphragm should be thin, fastened at its periphery and flex at its centre. In his patents Spence taught, according to the expert, that the diaphragm should be rigid, should be unfastened at its periphery and should not flex freely at the centre. In short, that Spence repudiated the universally accepted teachings of the art. It is for you to determine from the proof whether or no apparatus or devices covered by the Spence patents were marketable products."

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Defendant took no exception to this instruction and did not ask for any further instruction on the point.

There was no question raised as to the scope of the claims. Defendant's expert defined that scope. There was no issue as to whether defendant's or plaintiff's devices were covered by the patents. The sole issue was whether the devices within the claims had commercial value. That question the court left to the jury. The defendant took no exception.

Defendant contends the court erred in admitting in evidence documents included in Prickett Exhibits Nos. 300 to 1087.

The grant of inspection of the above documents was not error. Long before trial plaintiff filed a motion for leave to inspect. The motion papers showed that the documents had been produced by defendant in response to a stipulated subpoena duces tecum which by its terms limited production to documents material to the case. Having produced the documents defendant refused inspection of them and the court referred the matter to William Prickett as special master. The master classified the documents solely on the basis of their materiality to

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plaintiff's prima facie case as he understood the issues. He reported that inspection should not be made of Prickett Exhibits Nos. 300 to 1087.

Under rule 34 of the Federal Rules of Civil Procedure the right of inspection runs to documents "which constitute or contain evidence material to any matter involved in the action". In proving its own case defendant produced documents from among Prickett Exhibits Nos. 300 to 1087 and caused them to be introduced in evidence. Documents offered by plaintiff from this same class of exhibits and admitted by the court related to matters "involved in the action" within rule 34.

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Cases involving motions to quash indictments and to restrain prosecuting officers from using material procured by unlawful search and seizure are wholly irrelevant. So are cases where wholesale delivery of documents is demanded by administrative agencies of the Government without any attempt to show materiality or to specify the documents with particularity.

The court finds no error in admitting the testimony of Hollister and of other witnesses produced by plaintiff. In view of the testimony above recited the court finds the verdict not so excessive as to warrant setting it aside or granting a new trial.

Each of defendant's motions respecting the verdict and judgment of $100,000 must be denied.

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Interest.

July 17, 1939 the jury in this case rendered a verdict in favor of plaintiff in the amount of $100,000 and three days thereafter judgment for that sum was entered. July 26, 1939 plaintiff moved that said judgment be corrected so as to include interest in the sum of $60,821.92, computed at 6% per annum from the date of the institution of suit, June 1, 1929, to the date of the entry of the judgment.

Plaintiff's motion for the recovery and inclusion of interest was made under Section 480 of the Civil Practice Act of the State of New York. The jurisdiction of the court to grant the relief prayed and the timeliness of the motion are recognized by Rules 54(c) and 60(a) of the Federal Rules of Civil Procedure.

Section 480 provides:

> "In every action wherein any sum of money shall be awarded by verdict, report or decision

upon a cause of action for the enforcement of or based upon breach of performance of a contract, express or implied, interest shall be recovered upon the principal sum whether theretofore liquidated or unliquidated and shall be added to and be a part of the total sum awarded."

Rule 54(c) provides:

"* * * every final judgment shall grant the relief to which the party in whose favor it is rendered is entitled, even if the party has not demanded such relief in his pleadings."

Rule 60(a) provides:

"Clerical mistakes in judgments, orders, or other parts of the record and errors therein arising from

oversight or omission may be corrected by the court at any time of its own initiative or on the motion of any party and after such notice, if any, as the court orders."

This license agreement was negotiated, executed and delivered by the parties in New York. Under the provisions of the contract the plaintiff in New York transferred to defendant its entire business as a going concern, including unfilled orders and outstanding receivables, which business the plaintiff was then conducting in New York; and transferred to defendant all of its tangible property, the same being located in New York. Defendant thereupon commenced performance under the contract as provided therein at the premises formerly occupied by plaintiff at 68 Hunters Point Avenue, Long Island City, New York. Payment of the purchase price as provided in the contract was made to plaintiff in New

York. Further payments from time to time throughout the term of the contract were made to plaintiff in New York. The license agreement in suit is a New York contract.

Defendant in its answer admits "that the instrument of writing of May 20, 1918 was made in the State of New York". The rights of the parties are therefore governed by New York law.

The question before the court is whether the plaintiff having recovered a verdict for breach of the license agreement is entitled as a matter of right to interest on the amount of the verdict pursuant to the New York statute.

The answer to this question must be found in the New York cases construing Section 480 of the New York Civil Practice Act. These cases hold the statute gives an abso-

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lute right as a matter of law to interest as a part of the damages for breach of contract, whether the damages were liquidated or unliquidated. The addition of interest is mandatory. Interest is not required to be a part of the verdict but is computed and added by the court to the principal sum awarded by the verdict. In the absence of proof of a fixed date of breach, interest is computed and added from the date of commencement of the action. *Manufacturers Trust Co.* v. *Gray,* 278 N. Y. 380, 387; *McLaughlin* v. *Brinckerhoff,* 222 App. Div. 458; *Quinn* v. *Sigretto,* 229 App. Div. 727; *Freedman* v. *Hart & Early Co.,* 162 Misc. 487; *Aronowsky* v. *Goldberger-Raabin Co.,* 250 App. Div. 731; *United States* v. *Stephanidis,* 41 F. (2d) 960. In such a case as this the New York rule as to interest prevails.

Defendant contends, "By not requesting an instruction as to interest, plaintiff waived any claim thereto". Such is not the New York law. Plaintiff being entitled to interest as matter of law there was no issue of fact as to interest to be submitted to the jury.

No case has been cited by plaintiff where Section 480 of the Civil Practice Act of New York has been applied to include recovery of interest for delay in an action on a New York contract brought in a district outside of New York. Presumably there is no such reported case. However, the cases cited set forth the rules of law controlling this case.

Suit was brought in Minnesota. The accident occurred in Montana. Holding that damages were controlled by —143— the law of Minnesota, the Supreme Court declared:

> "The question which those assignments of error present is, was the amount of damage to be controlled by the law of the place of employment and where the accident occurred, or by the law of the forum in which the suit was pending? In the case of *Herrick* v. *Minneapolis & St. Louis Railway Company,* reported in 31 Minnesota, 11, which involved the question of whether the courts of Minnesota would enforce and apply to a Suit in that state for a cause of action originating in Iowa a law of the State of Iowa making railroad corporations liable for damages sustained by its employes in consequence of the neglect of fellow-servants, the court said:
>
> 'The statute of another State has, of course, no extraterritorial force, but rights acquired under it will always, in comity, be enforced, if not against the public policy of the laws of the former. In such cases the law of the place where the right was acquired, or the liability was incurred, will govern as to the *right of action*; while all that pertains merely to the

> remedy will be controlled by the law of the State where the action is brought. And we think the principle is the same, whether the right of action be ex contractu or ex delicto. * * *"
>
> The contract of employment was made in Montana, and the accident occurred in that State, while the suit was brought in Minnesota. We think there was no error in holding that the right to recover was governed by the *lex loci*, and not by the *lex fori*." *Northern Pacific Railroad* v. *Babcock*, 154 U. S. 190, 197.

Suit was brought in Maryland. The contract was made in Missouri. Damages were unliquidated. The trial court refused to allow interest from the institution of the suit because under the law of the forum interest was not compulsory. The Circuit Court of Appeals reversed this finding:

> "This brings us to the last objection made by the bridge company touching the disallowance of interest. While it is true this cause was trial [tried] in Maryland, where by statute the allowance of interest is left to the discretion of the court, yet it is also true that this contract was a Missouri one. The statute of this latter state (section 3705, c. 40, Rev. St. Mo. 1899 [Ann. St. 1906, p. 2073]),
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>
>
> provides:
>
> 'Creditors shall be allowed to receive interest at the rate of six per centum per annum when no other rate is agreed upon for all moneys after they become due and payable on written contracts and on accounts after they become due and demand of payment is made.'

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The Supreme Court of Missouri in construing this statute has held that such interest will not be allowed on account until after demand is made. *Evans* v. *Western Brass Mfg. Co.*, 118 Mo. 548, 24 S. W. 175; *Southgate* v. *A. & P. R. R. Co.*, 61 Mo. 89. But it has further held that the institution of suit constitutes such demand, and in case no prior demand has been proven, then interest should be awarded from the date of service of process, or, in the absence of proof of date of service, from the commencement of the suit. *Dempsey* v. *Schawacker*, 140 Mo. 680, 38 S. W. 954, 41 S: W. 1100. The controversy arose in Maryland only by reason of the accidental location of the attached funds there of the railroad company. By the finding of the trial court, an aggregate of $38,406.43 remained unpaid, and suit to recover it had been instituted on September 12, 1904, nearly 17 months before judgment rendered. We think the bridge company clearly was entitled to interest for this period, both under the Missouri statute and the federal authorities." *Freygang* v. *Vera Cruz & P. R. Co.* (C. C. A. 4), 154 Fed. 640, 646.

Suit was brought in Oklahoma. The contract was made in Texas where interest was allowable. The court said:

"Whether the action be regarded as one in tort for conversion or upon an implied contract, the measure of damages is to be determined by the law of Texas. The measure of damages in an action for tort is determined by the law of the place of the wrong; and in an action on a contract by the law of the place of the contract. * * *

Under the law of Texas the measure of damages, whether the action be for a wrongful con-

version or for the value of the property converted upon the promise which the law implies from the conversion, is the reasonable value of the property at the time of the conversion, measured by the market value thereof if it has a market value at the time of the conversion, with interest from the date of the conversion." *Wynne* v. *McCarthy* (C. C. A. 10), 97 Fed. (2d) 964, 970.

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A death action was brought and tried in New York. The death occurred in Ontario, Canada. There was a verdict for the plaintiff. Following the New York statute governing damages in death actions, the court below added interest from the date of the death to the amount of the verdict and entered judgment for the aggregate of those two amounts. Upon appeal the question was whether the right to interest was governed by the law of the place of accident or by the law of the place of trial. The Appellate Division held that interest is of the substance and not of the remedy and modified the judgment by striking therefrom the item of interest. *Kiefer* v. *Grand Trunk Ry. Co.*, 42 N. Y. Supp. 171; affirmed 153 N. Y. 688.

In the later case of *Loucks* v. *Standard Oil Co.*, 224 N. Y. 99, 109, Judge Cardozo referred to the above case in the following language:

"In *Kiefer* v. *Grand Trunk Ry. Co.* the death occurred in Canada. Canada has a statute similar to our own. The chief difference is in the award of interest. * * * We held that interest had relation to the substance of the right, and must be governed by the foreign statute."

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Suit was brought in Pennsylvania for a tort occurring in Virginia. The Court of Appeals of this circuit held the Virginia statute governed as to all substantive rights including the right to damages:

> "The heart of the matter is that the law of the place of a tort gives a 'right of action' to one falling within its terms; and it does so without regard to the residence of the tort-feasor. In such case 'the law of the place where the right of action was acquired or the liability was incurred will govern as to the right of action', • • • and as to the measure of damages, • • • 'while all that per-
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> tains merely to the remedy will be controlled by the law of the state where the action is brought', • • •." *Curtis* v. *Campbell* (C. C. A. 3), 76 F. (2d) 84, 85.

This court has followed the law as laid down above. Suit was brought upon a contractor's bond executed in North Carolina. The North Carolina statute provided for interest for breach of a contract but expressly excluded interest upon a penal bond. Following the provisions of the North Carolina statute this court disallowed interest:

> "The United States, however, seeks to recover, not only the penalty of the bond, but also damages in excess of the penalty for its detention, the measure of such damages to be the interest on the amount due from the time it should have been paid to the date of judgment. Whether in any case judgment in favor of the obligee in a penal bond may exceed the penalty has been the subject of 'much contrariety of opinion', but, while consider-

> ing the question of the amount of recovery upon a contractor's bond similar in substance and purpose to the one here under consideration, the Supreme Court in *Illinois Surety Co.* v. *John Davis Co.*, 244 U. S. 376, 381, 37 Sup. Ct. 614, 617 (61 L. Ed. 1206), laid down a rule which, in my opinion, controls the decision in this case. It said: 'The contract and bond were made in Illinois and were to be performed there. Questions of liability for interest must therefore be determined by the law of that state.'" *United States* v. *Garland*, 271 Fed. 14.

Defendant relies principally upon the case of *Preston Co.* v. *Funkhouser*, 261 N. Y. 140; 290 U. S. 163. In its brief defendant states:

> "This decision was predicted solely on the ground that section 480 related to matters of procedure and remedy and *hence* disturbed no contractual obligations. The Chief Justice said at page 167: '* * * The statute in question concerns the remedy * * *'."

The vice of defendant's entire argument arises from its deductions from this incomplete quotation. What the

Chief Justice said was: "The statute in question concerns the remedy *and* does not disturb the obligations of the contract." It should be noted that defendant has substituted the word "hence" for the conjunction "and" used by the Chief Justice.

Defendant argues that by the language above quoted the Supreme Court held that Section 480 "related to matters of procedure and remedy", and since Section 480 deals with the allowance of interest, therefore the

Supreme Court held that interest is only a matter of procedure or remedy. Defendant further argues that all matters of procedure and remedy are governed by the law of the forum. Therefore, it concludes the Supreme Court held that the right to interest is governed by the law of the forum and not by the law of the place of the contract.

As applied to this case the whole argument is unsound. *Preston* v. *Funkhouser* was a suit for damages for breach of a contract. The contract was entered into before the enactment of Section 480. The damages were unliquidated. There was no provision in the contract for interest. If interest was to be recovered, it was interest on account of delay. The verdict was for $45,889.70. Under Section 480 the court added interest of $14,417.51. The question in the case was not whether Section 480 goes to the remedy but whether it impaired the obligation of the contract.

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"The test of constitutionality is the simple one of finding whether by the statute existing contractual rights are diminished or existing obligations increased. The rule is that any statute imposing conditions not expressed in the contract or dispensing with those which are, would be a statute impairing the obligation of a contract.

> "There is a broad distinction between laws impairing the obligation of contracts and those which simply undertake to give a more efficient remedy to enforce a contract already made." *Bernheimer* v. *Converse*, 206 U. S. 516, 530.

The Supreme Court recognized an obligation to pay interest before the passage of Section 480. It declared the section was to give a more efficient remedy for the

enforcement of an obligation. Damages themselves are but a remedy. Parties do not contract for breach. They contract for performance. Should breach occur the law gives a remedy, to wit, damages. The Supreme Court declared:

> "The mere fact that such legislation is retroactive does not bring it into conflict with the guarantees of the Federal Constitution * * * and when the action of the Legislature is directed to the enforcement of the obligations assumed by the parties and to the giving of suitable relief for non-performance, it can not be said that the obligations of the contract had been impaired. The parties make their contract with reference to the existence of the power of the State to provide remedies for enforcement and to secure adequate redress in case of breach." *Funkhouser* v. *Preston Co.*, 290 U. S. 163, 167.

The Supreme Court was dealing with a constitutional question. Therefore the remark of the Chief Justice that

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the statute concerns the remedy and did not disturb or impair the obligation of the contract has no application to the case in hand.

Plaintiff's motion that the judgment of $100,000 be corrected so as to include interest of $60,821.92 must be granted.

(Sgd.) JOHN P. NIELDS,
J.

November 28, 1939.

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Order Denying Defendant's Motion That Verdict and Judgment Be Set Aside.

(Filed December 14, 1939.)

AND NOW, to-wit, this 14th day of December, A. D. 1939, this cause having come on to be heard upon the motion of the defendant that (1) the verdict and judgment be set aside, (2) that judgment be entered for the defendant, or (3) that a new trial be granted, the said motion having been argued by counsel for the respective parties and maturely considered by the Court it is, upon motion of Murray C. Bernays, Esq., and Paul Leahy, Esq., attorneys for the plaintiff,

ORDERED, ADJUDGED AND DECREED by the Court that the defendant's motions to have the verdict and the judgment entered thereon set aside, to have judgment entered for the defendant, or, that a new trial be granted be and the same hereby is denied in all respects.

(Sgd.) JOHN P. NIELDS,
J.

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Order That Judgment be Corrected to Include Interest.

(Filed December 14, 1939.)

AND NOW, to-wit, this 14th day of December, A. D. 1939, this cause having come on to be heard upon the motion of the plaintiff that the judgment entered herein on the twentieth day of July, A. D. 1939 be corrected so as to include interest thereon from the first day of June, A. D. 1929, the date of the institution of this suit, to the date of the entry of said judgment, pursuant to Section 480 of

Order that Judgment be Corrected to Include Interest.

the Civil Practice Act of the State of New York, and having been argued by counsel for the respective parties and maturely considered by the court, it is, upon motion of Murray C. Bernays, Esq. and Paul Leahy, Esq., attorneys for plaintiff,

ORDERED, ADJUDGED AND DECREED by the court as follows:

(1) That said motion of plaintiff be and hereby is granted.

(2) That interest shall be recovered by said plaintiff upon the sum of One Hundred Thousand Dollars ($100,000.00), the principal sum awarded by the verdict of the jury, computed at the rate of 6% per annum from June 1, 1929, the date of the institution of this suit, to the twentieth day of July, A. D. 1939, the date of the entry of judgment herein, and that said interest, amounting to the sum of Sixty Thousand Eight Hundred and Twenty-One Dollars and Ninety-two Cents ($60,821.92),

be added to and be a part of the total sum awarded to the plaintiff herein.

(3) That the judgment heretofore entered in this cause on the twentieth day of July, A. D. 1939 be and the same hereby is amended and corrected to read as follows:

> "AND NOW, to-wit, this 20th day of July, A. D. 1939, it is considered and adjudged by the court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of One Hundred Sixty Thousand Eight Hundred Twenty-one and 92/100 Dollars ($160,821.92) and its costs in and about this suit expended, and have execution therefor."

(4) That the Clerk of this court forthwith amend and correct the said judgment accordingly.

(Sgd.) JOHN P. NIELDS,
J.

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Final Judgment.

(Entered December 14, 1939.)

And now, to wit, this 20th day of July, A. D. 1939, it is considered and adjudged by the court now here that the said Stentor Electric Manufacturing Company, Inc., plaintiff, do have and recover of and from the said Klaxon Company, defendant, the sum of One hundred sixty thousand eight hundred twenty one and 92/100 dollars ($160,821.92) and its costs in and about this suit expended, and have execution therefor.

Attest:

H. C. MAHAFFY, JR.,
Clerk.

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Notice of Appeal.

(Filed February 9, 1940.)

To: Messrs. Ward & Gray,
Attorneys for Plaintiff.

Sirs:

Take notice that Klaxon Company, above named defendant, does hereby appeal to the United States Circuit Court of Appeals for the Third Circuit from the whole and every part of the final judgment entered in the above entitled cause July 20, 1939, in favor of the plaintiff and against the defendant for the sum of $100,000, as amended and corrected on December 14, 1939, by adding thereto interest at the rate of 6% per annum from June 1, 1929, the date of the institution of this suit, to the 20th day of July, 1939, the date of the entry of judgment herein, the said final judgment as amended having been entered December 14, 1939, in the sum of $160,821.92, together with costs.

Respectfully yours,

KLAXON COMPANY,
By (Sgd.) Hugh M. Morris,
(Sgd.) Edwin D. Steel, Jr.,
Its Attorneys.

Dated, February 8, 1940.

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Defendant's Statement of Points.

(Filed February 28, 1940.)

Defendant does hereby specify the following Statement of Points on which it will rely for a reversal of the judgment entered in favor of plaintiff in the above entitled cause in the United States District Court for the District of Delaware:

(1) Because the learned Judge of the District Court erred in permitting the witness Hollister to testify as to a computation of damages alleged to have been suffered by the plaintiff which were based upon the reports of the United States census, over objection of counsel for the defendant that figures from the United States census have nothing to do with damages in this case (R. 368-369).

(2) Because the learned Judge of the District Court erred in overruling defendant's objection to the answer given by the witness Hollister as to the number of receiver sets that were manufactured for use in radio in the years 1923, 1925 and 1927 according to the census figures, and his estimate for the unreported years of 1922, 1924 and 1926, and in refusing to strike out said answer (R. 372, 374).

(3) Because the learned Judge of the District Court erred in declining to strike out that portion of the answer of the witness Hollister reading as follows:

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"That represents in these six years a business in these receiver units in radio alone of $40,000,000 and a profit of $20,000,000. I am assuming that Klaxon would have obtained during these six years only one-tenth of that business. That would have

been a profit of $2,000,000 for Klaxon of which Stentor's share would have been $1,000,000",

which motion to strike out was on the ground that it was purely speculative of the highest order and not proper evidence of damages in this case (R. 375, 377).

(4) Because the learned Judge of the District Court erred in allowing in evidence Table X, page 1060, of the Biennial Census of Manufacturers for 1927 (Plaintiff's Ex. 50), over defendant's objection that it was not a proper basis for the ascertainment of damages other than by the purest speculation (R. 379).

(5) Because the learned Judge of the District Court erred in allowing in evidence Volume X of the Fourteenth Census (Plaintiff's Ex. 51, R. 380, 381), over defendant's objection that it was not a proper basis for the ascertainment of damages other than by the purest speculation.

(6) Because the learned Judge of the District Court erred in allowing in evidence volume of the Biennial Census of Manufacturers for 1927 (Plaintiff's Ex. 52, R. 382, 383), over defendant's objection that it was not a proper basis for the ascertainment of damages other than by the purest speculation.

(7) Because the learned Judge of the District Court erred in overruling defendant's objection to the following

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question put to the witness Hollister on redirect examination:

"Will you state please, what the figure is arrived at by you in that respect?"

(meaning the best computation that witness could make of the amount by which "Stentor received lesser profits

for the years 1928, 1929 and 1930 than it would have received but for those facts" (R. 386, 387, 388), the objection being that the question called for an assumption on an assumption and was purely speculative).

(8) Because the learned Judge of the District Court erred in overruling defendant's objection to the following question put to the witness Hollister on redirect examination:

> "Give us your computation and the final figure Mr. Hollister"

(as to a computation by witness of profits distributable under the agreement by Klaxon upon the basis of Klaxon doing in each remaining year of the agreement after 1918 what was done in the seven and one-half months of 1918) (R. 394, 395, 396, 397).

(9) Because the learned Judge of the District Court declined to grant defendant's motion for the direction of a verdict in favor of the defendant.

(10) Because the learned Judge of the District Court declined to charge the jury in accordance with defendant's first prayer as follows:

> "That your verdict must be for the defendant."

(11) Because the learned Judge of the District Court

after declining to charge defendant's first prayer erred in declining to charge defendant's ninth prayer as follows:

> "That if you find that the plaintiff and the defendant entered into the agreement of May 20, 1918, and that the defendant failed to use its best efforts to further the manufacture and sale of the

articles covered by the agreement, and that it failed to maintain an efficient organization for the manufacture and sale of such articles, nevertheless, under the evidence which has been introduced, the plaintiff is entitled to recover nominal damages only. Therefore, if your verdict is for the plaintiff, it shall in no event exceed the amount of Six Cents (6¢)."

(12) Because the learned Judge of the District Court declined to charge the jury defendant's sixteenth prayer as follows:

"That, if you find with reasonable certainty from the evidence the amount of the net profits the defendant would have made, had it used its best efforts to manufacture and sell the articles covered by the agreement, and had it maintained an efficient organization for the manufacture and sale of such articles, then, if your verdict is for the plaintiff, it shall be only in the amount of Six Cents (6¢), unless you find with reasonable certainty that such net profits would have been in excess of fifteen per cent (15%) of the cost of manufacture, as heretofore defined."

(13) Because the learned Judge of the District Court erred in declining to charge the jury defendant's twenty-seventh prayer as follows:

"The Spence receiver patent conferred no au-

thority upon the defendant to manufacture the cone or dynamic type of radio receiver. This is true, even though it be assumed that the words of the claims of the Spence receiver patent read upon the diaphragm and mounting of the cone or dynamic type receiver."

(14) Because the learned Judge of the District Court erred in declining to charge the jury defendant's thirty-first prayer as follows:

> "That you shall disregard entirely the contents of the memorandum from L. O. Parker to C. E. Wilson, dated July 27, 1926, which is plaintiff's exhibit 38, for the reason that the contents of such memorandum have no relationship to or bearing upon the issues in this case and are in all respects without pertinency or relevancy to such issues."

(15) Because the learned Judge of the District Court erred in charging the jury as follows:

> "It is for the jury to determine whether or no the patents were limited to the devices specified therein and whether the patents so limited were of any commercial value."

(16) Because the learned Judge of the District Court erred in charging the Jury as follows:

> "The evidence establishes that these requisites" (of a novation) "are here wanting, and this defense" (#14) "is overruled."

(17) Because the Court erred in charging the jury as follows:

> "You may take into consideration the evidence of the practice of the defendant in selling to affili-
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> ated companies in the General Motors Group at lower prices than it charged outsiders, provided you are satisfied that such sales could have been made to the affiliated companies at the prices charged outsiders."

(18) Because the Court erred in admitting, over objection, plaintiff's exhibits numbered 38, 39, 40, 43, 50, 51 and 52.

(19) Because the Court erred in ruling that the agreement of May 20, 1918, was a license and not an assignment and in refusing to permit the defendant to offer any evidence to establish the invalidity of the patents which were the subject of said agreement of May 20, 1918, and in charging the jury that said agreement was a license and an assignment.

(20) Because the learned Judge of the District Court erred in answering the following question of the jury:

> "Under Article 17th of the contract between Stentor and Klaxon dated May 20, 1918, the Klaxon Company had the right upon thirty days notice to Stentor to cancel the contract provided when by reason of obsolescence of the articles covered by said patents a net profit of fifteen per cent could not be secured by the Klaxon Company",

as follows:

> "In answering that question the Court instructs you if you find that the articles covered by the agreement were or became obsolete, and if you find in addition that Klaxon could not earn a profit of fifteen per cent upon the sale of such obsolescent articles, then Klaxon had the right to cancel the
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> agreement upon giving thirty days written notice by registered mail to Stentor, under Article 17th of the agreement."

(21) Because the Court answered the following question submitted by the jury:

> "Could Klaxon have cancelled the contract without agreement with Stentor that the articles covered by said patents were obsolete?",

as follows:

> "The Court instructs you: You further ask, 'Could Klaxon have cancelled the contract without agreement with Stentor that the articles covered by said patents were obsolete?' If you find from the proof that the articles were or became obsolete the answer to this question also is 'Yes'."

(22) Because the learned Judge of the District Court erred in granting plaintiff's motion to correct the judgment rendered on the verdict of the jury for $100,000.00 so as to include interest of $60,821.92, and by entering judgment in favor of the plaintiff and against the defendant for said interest item of $60,821.92.

(23) Because the trial judge erred in overruling defendant's first affirmative defense that the complaint fails to state a cause of action; in that at the time of the commencement of the action plaintiff was a dissolved corporation and could not sue for damages for breach of contract as alleged in the complaint.

(Sgd.) HUGH M. MORRIS,

(Sgd.) EDWIN D. STEEL, JR.,
Attorneys for Defendant.

Testimony.

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BUELL HOLLISTER was called as a witness on behalf of the plaintiff, and having been first duly sworn, testified as follows:

Direct examination by Mr. Bernays:

Q. Mr. Hollister, where do you live? A. New York City, and in Islip, Long Island.

Q. And what is your business? A. I am a member of the New York Stock Exchange firm of Pine, Kendall & Hollister.

Q. Mr. Hollister, do you remember the organization of the New York corporation, Electrical Experiment Company, Inc.? A. Yes.

Q. Were you interested in the organization of that company at the time when it was organized? A. Yes, I was.

Q. Were you one of its organizers? A. Yes.

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Q. I show you a certified set of papers from the office of the Secretary of State of the State of New York, and ask you whether you recognize that as a certified copy of the Certificate of Incorporation of Electrical Experiment Company, Inc., the company to which I have referred? A. Yes, this is a certified copy as described by you.

Q. What was the date of the organization of that company, Mr. Hollister? A. May 20, 1913.

(Received in evidence and marked "Plaintiff's Exhibit No. 1".)

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XQ. Are you able to say that there was a profit in

1913, a net profit? A. I have no remembrance, but I should doubt it very much.

XQ. Are you able to say that there was a net profit for 1914? A. I should doubt it.

XQ. Are you able to say that there was a net profit to the Stentor Company in 1915? A. That I do not know, but the sales were increasing and the uses were being expanded, and we were starting out and getting at our experimental work, approaching a time when we would get a profit if we did not have one.

XQ. Your answer is that you do not know that you had a profit? A. No, sir, I did not answer it that way.

XQ. Your answer is that you do not know that you had a profit in 1916? A. The same answer as to the other question.

XQ. In other words, you do not know whether there was

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a net profit? A. I did not say that.

XQ. Was there a net profit in 1917, as shown by the books of the company? A. The only records I have to show that are the income tax papers which have already been exposed here. I have no other records.

XQ. Very good. At the time the income tax returns were made, the books had not been turned over to the Klaxon Company, had they, the 1917 income tax returns? A. There was an item there.

XQ. Can you answer that question "Yes" or "No"? A. The books, the papers which Haskins & Sells gave us at the time the company was turned over showed a liability on the Stentor books of the full amount of the income tax which was paid April 29, 1918.

XQ. Had the books of account of the Stentor Company been turned over to the Klaxon Company at the time the Stentor Company made its income tax return for the calendar year 1917? A. I should say not. I have no direct remembrance.

XQ. Then there should have been no difficulty, should there, in ascertaining from the books of the Klaxon Com-

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pany, if they had sufficient records— A. Of the Klaxon Company?

XQ. Stentor. Thank you very much. I am sorry. Ascertaining from the Stentor Company, at the time you made the income tax return in 1917, as to whether there was or there was not a profit? A. At that time we had no difficulty at all because we made the returns, which showed a profit.

XQ. Did you ever ask——

The Court: "In" or "for" 1917. Which did you mean?

Mr. Morris: "For."

The Court: You said "in." You meant "for" when you answered the question?

The Witness: It was for 1917, yes, sir.

XQ. Did you make any request later for a refund of the taxes for 1917? A. Part of the taxes, it has already been testified here.

XQ. What representations did you make to the Internal Revenue Department at the time you made that request? A. At the time we made the original return, we made

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no request at that time, sir.

XQ. Not the time you made the return but at the time you made the request. A. I think I stated yesterday that we were borrowing considerable amounts of money and the Government under the tax laws then allowed a certain amount of borrowed money to be considered as capital employed in the business, and it was on that basis on which the return, as read to you yesterday, was given. The Government eventually allowed us to consider the

part of the sums borrowed by us as capital employed in our business.

XQ. If you had sufficient books kept by the Stentor Company, of course you would have had sufficient records to show gross sales, would you not? A. We gave the gross sales in both those returns.

XQ. If the Stentor Company books were sufficient for its purposes, you would have been able in 1918, before the books were turned over to the Klaxon Company, to ascertain the gross sales, would you not?

Mr. Bernays: I object to that question as entirely hypothetical and, therefore, improper both in form and in substance.

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The Court: Objection overruled.
Mr. Bernays: Exception.
The Court: Let an exception be entered.
(Last question repeated as recorded.)

A. At that time, to the best of our knowledge and belief, we did give the gross sales.

XQ. You did what? A. At that time, to our best information and knowledge, we did give the gross sales for the year 1917 in that tax return.

XQ. That is not my question. A. Excuse me.

XQ. I am talking about the sufficiency of the books kept by the Stentor Company for the years prior to 1918, and I am directing my attention specifically and particularly to the books showing what was done by the Stentor Company in 1917, and you told me a little while ago that the books of the Stentor Company were sufficient for its purposes? A. Yes.

XQ. Now, I am asking you if the books of the Stentor Company were sufficient for its purposes, would those

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books not have shown and reflected the gross sales for, we will say, the year 1917? A. The books were evidently sufficient for the man who made up the income tax return to think that they were and he did give, as I signed the return myself, those figures and I thought that they were the correct figures, naturally.

XQ. Will you follow me as I read from your own own exhibit, Plaintiff's Exhibit No. 28, which was signed by you, was it, Mr. Hollister? A. Yes.

XQ. Do I read correctly, and this is a letter of March 8, 1922, to the Commissioner of Internal Revenue, Washington, D. C.:

> "The gross sales for 1917 as reported by us on Form 1031 were $50,895.07. This, however, we are unable to substantiate but from the data available we believe that it was about $20,000 less than the actual sales made."

Do I read correctly? A. Yes, sir. It says above—may I read?

XQ. Yes, read any part you want. A. It says above

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that our records are not complete.

XQ. They were complete enough even in 1922 for you to doubt the correctness of the return made for 1917, were they not, Mr. Hollister? A. Those figures in 1922 were furnished me and the facts, as given by me at that time were, to my belief at that time, evidently—I am not an accountant—were sufficient for making such a request but the Government did not grant it.

XQ. What do you mean, that you are not an accountant, that you did not know whether the books were properly kept or not? A. I am not an accountant in that I do not go over the books and I do not make out the income tax returns.

XQ. But are you still able to say that the books kept by the Stentor Company during the years 1913 to 1918, were sufficient for the books to show the net profit, if any, to the Stentor Company? A. Specifically, in 1917, the Government evidently considered it so because they allowed our tax return and did not allow those figures, which I have no remembrance of at all.

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XQ. Were they sufficient? A. The Government evidently believed they were sufficient, and we did.

XQ. I am not speaking about what the Government believed. I am speaking about your representation that the books were off practically $20,000. A. I said that we believed it was about $20,000 less than actual sales. I have nothing by which to refresh my mind on that. It does not make any sense to me, and I do not believe—only at that time the figures were furnished me and evidently I did believe they were correct, but I cannot see now how that could be correct.

XQ. But it was a representation that you made to the Federal Government in order to get some money from it? A. To make a correct return, which was given to me at that time. Not to get money from the Government, no, sir.

XQ. What was the full net profit for the year 1917, as you can best ascertain it from the return for 1917 and any correspondence or any other papers that you have with respect to it? A. May I have the return?

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XQ. Yes. A. Because I remember round figures, but I can't remember them exactly.

XQ. I am going to ask you immediately after luncheon, if I may, to give me the net profit for 1917, and to May 20, 1918, of the Stentor Company, and I want any other net profit that you can find or that was made by the Stentor Company from the time of its organization up to

January 1, 1917. I am not going to ask you to guess about it. I am going to ask you if you have any books, records, documents or papers which will show any profit for the time I want it, and shortly after lunch I shall ask you for the net profit and how it was obtained for that five-year period during which you were running the Stentor Company?

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BUELL HOLLISTER resumed the stand and testified further as follows:

Re-direct examination by Mr. Bernays (continued):

RDQ. You will remember that on your cross examination yesterday, you were asked the following questions which I have on my note as being:

"XQ. How much more profit should Klaxon have made than it did make?" And thereafter a question was put to you by the Court which I have on my note as being, "How much profit should the defendant Klaxon have made?" And your answer was that you personally could not measure because it seemed to you so large.

Have you, since adjournment of Court yesterday, gone to the record and facts so far as they are within your knowledge and possession and attempted to measure what those profits should have been? A. Yes.

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RDQ. And are you now able to give the answer to the Court, based upon the study and the computations that you made between adjournment of Court yesterday and this morning? A. Yes.

Mr. Morris: No objection to the "Yes" answer, but I do not want on this question any more than the "Yes" answer.

RDQ. Will you please state what you would say that that measure should be, about which I am inquiring?

Mr. Morris: Such an answer would be, I submit, entirely speculative and unless this witness can show a proper basis for arriving at a damage, his taking a figure from the air and saying it is that, I submit is not evidence. I therefore object to this question.

Mr. Bernays: Before your Honor rules, and without addressing myself to anything else in Judge Morris's remark, I will add to my question, "Giving the Court and the Jury also the method by which you have arrived at any measure that you

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give, and at any result that you state."

Mr. Morris: Then the question should be divided, and if the last is put as the first question, I shall not object to it.

The Court: Suppose you reframe the question.

Mr. Bernays: I will, sir.

By Mr. Bernays:

RDQ. Will you be good enough, Mr. Hollister, using any memorandum or data that you may have brought with you to Court for that purpose, to tell the Court and the Jury how you have gone about trying to give that measure of profit which should have been made, and what result you arrived at by that method?

Mr. Morris: I object to the results of this question because they should not be combined. I submit

we may find that his methods are not appropriate methods, and then another result should not be given. The question that I assumed that was going to be asked was, "Have you pursued some method to arrive at a measure of damages, and if so, what methods have you followed," and then if those methods are followed or may even be considered,

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then we can find what the result is, but it seems to me that they should not be combined.

Mr. Bernays: If your Honor please, I stand upon the proposition that this is a question which was put to Mr. Hollister by my learned friend yesterday, pressed by him, and an answer taken over my objection upon the record, and in which question my friend did not even ask as to a method of computation, but asked as to the figure. I submit, sir, two things. In the first place, it is a manifest impossibility to give the method without using figures. In the second place, I submit——

The Court: What is the impossibility of indicating the method by which the ultimate figure was arrived at?

Mr. Bernays: Because that would be merely a theoretical statement of an approach which would have to turn on the facts which will be found in the records and information to which the witness has had recourse, but more than that I am only

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asking that to which my learned friend advisedly opened the door yesterday, and insisted that it be opened in spite of the fact that I was objecting to the question for the reasons which I then stated to your Honor, and I do not think, sir, that my learned friend, having opened the door for his purposes, and having taken the answer, that he is now entitled to close that door against us.

The Court: Is the witness now prepared to answer the question propounded by Judge Morris?

Mr. Bernays: I think so. He has stated that he is.

The Court: Will you repeat the question?

Mr. Bernays: Yes, sir. As stated by Judge Morris?

The Court: Exactly.

By Mr. Bernays:

RDQ. The question as I have it, as stated by Judge Morris, is, how much more profit Klaxon should have made than it did? I will put that question in that form without going into the method at this time.

Mr. Morris: That is substantially the question —448—

that I asked, and we need not turn to the record for that.

The Court: Very good. Are you prepared to answer the question?

The Witness: Yes, sir.

RDQ. You understand, Mr. Hollister, so that there will be no difficulty, that your answer to that question has nothing to do with any method that you used in arriving at the figure, but you are to give us the figure that you arrived at? A. I have several ideas on which the complaint was drawn. The first is obtained from——

RDQ. No,—Mr. Hollister, and that is why I gave you that caution a moment ago. Never mind where you obtained it or what method you used. The question is only as to the figure that you arrived at. A. May I read this?

RDQ. Certainly.

Mr. Morris: I object to his reading it unless I first have an opportunity to find out where he got it.

The Court: Yes. You do not have to read to

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any long extent the figure.

The Witness: No, I do not have to read the figure to any long extent.

The Court: And that is the question.

The Witness: Just the figure?

Mr. Morris: May I inquire where he got these figures. He did not know yesterday and he does know today, and I would like to know where he got his figures before he answers.

Mr. Bernays: I am willing to take that as a part of the answer and have the answer given by Mr. Hollister as modified by Judge Morris's request.

Mr. Morris: That is satisfactory to me.

The Court: Very good.

By Mr. Bernays:

RDQ. Tell us where you got the figures and the result arrived at by you? A. This first statement I am going to make or figures are from the census report.

Mr. Morris: I object already to any figures taken from census reports. I do not know what

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the census report may have to do with this situation, and until that is made clear, it seems to me that we are speculating most widely.

Mr. Bernays: I suggest, sir, that neither Judge Morris nor anybody else can say whether there is relevancy or whether it is speculative until the answer is in. The witness is in process of answer-

ing Judge Morris's own question as modified by the request that Judge Morris has made upon the record within the last three minutes, and I submit that that is now proper procedure entirely.

Mr. Morris: I do not get what my last request was that has now been referred to.

The Court: How did you arrive at the figures?

Mr. Morris: Oh, yes, that I understand.

The Court: The first suggestion is through the United States Census.

Mr. Morris: And I object to his stating figures from the United States Census because so far as I now know they may have nothing more to do with this trial of this case, or damages in this case, than—I will not make any comparison. I submit his answer on that basis should not be taken.

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Mr. Bernays: I stand upon the question on the ground that it is a proper answer to the question as put yesterday by Judge Morris and coupled with the request that he made this morning, and that it is not possible for Judge Morris or anybody else to say whether these figures are relevant or not until the answer is in and the figures are before us.

Mr. Morris: One more moment, and then I shall have nothing more to say about it. The argument of the learned counsel says the answer should be taken without it being made apparent that it is pertinent, and then after the figures are given in this case, then we will discuss as to whether they are pertinent or not, and I submit that that is reversible, as you can see.

The Court: Shall we revert to the original question? What is the figure?

Mr. Morris: That is, the ultimate figure? Does your Honor have in mind the ultimate figure?

The Court: I do not know what it is, but whatever the witness has in mind.

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Mr. Morris: May I enter an objection and preserve whatever rights I may have.

The Court: The question put is precisely the question you put.

Mr. Morris: Yes.

The Court: Do you object to that question?

Mr. Morris: I did not object to that question.

The Court: Very good. What is the figure?

By Mr. Bernays:

RDQ. Do you have that? We are now back to the point where we are asking you only to give us the figure at this time. A. Yes, sir. May I say that I have three different lines——

RDQ. We will come to this, Mr. Hollister. You mentioned a moment ago certain figures to which you had had recourse? A. Yes.

RDQ. Referring to the census? A. Yes.

RDQ. We are not asking you now how you arrived at the figure that you are going to give us. We are

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asking you to give to the Court and jury the figure itself. A. May I say the business in which this figure is derived from?

The Court: The figure.

RDQ. Just the figure and never mind any detail or underlying data. A. $2,000,000.

RDQ. I will ask you now, Mr. Hollister, to explain to

the Court and the jury by what method, and having recourse to what data, you arrived at that figure? A. There were manufactured in the census years 1923, 1925 and 1927, just under 10,000,000 receiver units for use in radio according to the census figures. Making an estimate for the unreported years, for 1922, 1924 and 1926 of the same total, we have an aggregate for these six years, 1922 to 1927, inclusive, of 20,000,000 such receiver units for use in radio.

These units could have been produced in quantity at $1 each. There was a ready market for them at such prices as to show a net profit of not less than $1 apiece for them to the Klaxon Company. This represents in those six

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years' business in these receivers——

Mr. Morris: May I inquire what he is reading from?

The Court: Certainly.

Mr. Morris: What is the paper that you are reading from?

The Witness: It is a statement which I, together with counsel and my associates, prepared last night in my handwriting.

Mr. Morris: It is in your handwriting but whose voice is it?

The Witness: It is my voice together with theirs. I consulted with my counsel, sir.

Mr. Morris: Your voice and your handwriting. Did counsel dictate any part of it?

The Witness: Dictate any part of this?

Mr. Morris: Yes.

The Witness: No, this is my own handwriting.

Mr. Morris: I understand that you used the pencil, but who told you what to write?

The Witness: We discussed the matter backwards and forwards and then I wrote this myself.

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Mr. Morris: You are unable to state what you wrote without reading it?

The Witness: We discussed the whole matter together, and then I wrote this out myself. That is all I can say.

Mr. Morris: You are unable to say now what conclusion you arrived at without reading what you wrote after discussing it with counsel?

The Court: I do not get that question.

Mr. Morris: I object to his reading it and ask that his answer, as far as read, be stricken out.

The Court: Both objections are overruled. You have the right to use the memorandum that you prepared with the collaboration of others.

The Witness: Yes, sir.

Mr. Morris: May I have an exception, please?

The Court: Certainly, let an exception be entered.

A. (Continued.) I will go back one sentence. There was a ready market for them at such prices as to show a net profit of not less than one dollar apiece for them to

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the Klaxon Company.

The Court: My ruling was solely with reference to the use of the memoranda. As to the pertinency of this census information——

Mr. Morris: I understand that.

The Court: That is another matter entirely.

Mr. Morris: Yes.

A. (Continued.) That represents in these six years a business in these receiver units in radio alone of

$40,000,000 and a profit of $20,000,000. I am assuming that Klaxon would have obtained during these six years only one-tenth of that business. That would have been a profit of $2,000,000 for Klaxon, of which Stentor's share would have been $1,000,000.

This leaves out of consideration all other fields of use for this device in such things as office intercommunicating, public address systems, interior telephone systems and so on, but I will take an example of the interior telephone system which I have just mentioned.

The telephone systems reported with a factory value of over $1,578,000 in 1919; $4,433,000 in 1925 and over $3,351,000 in 1927, a total in these three years alone of

$9,371,000.

You will note I have only referred here to production in America, because the Klaxon Company and its affiliates have a tremendous market abroad where the demand for radio was equally, I believe, as large as it was here. So that you can understand the enormous business.

By Mr. Bernays:

RDQ. Mr. Hollister, you have referred to census figures to which you had recourse. I show you a copy published and issued by the United States Government Printing Office at Washington, D. C. of the Biennial Census of Manufactures for the year 1927, and more particularly Table X at page 1060 thereof and ask you whether the figures on that page are figures for the years 1923, 1925 and 1927, to which you have referred and had recourse in respect of loud speakers and head sets for radio use?

Mr. Morris: May I object to this question as not being a proper basis for a question of damages in this case. May I also now move to strike out

the last answer of the witness on the ground that he, having disclosed it, shows that it is purely

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speculative of the highest order and not proper evidence of damages in this case.

The Court: You started with the year 1927?

The Witness: 1922 I started with. I include the years 1922 to 1927, inclusive.

The Court: You are asking whether or no that is the source?

Mr. Bernays: Whether this is the source of the figures as to the reported years, the census being a biennial census, the reported years 1923, 1925 and 1927.

The Court: You object to the witness replying that he used those figures as the basis of his statement?

Mr. Morris: I will withdraw that, but I do want to press my other motion.

The Court: If the tender is made to the census, we may get into it.

Mr. Morris: All I want is the record to show at this time that I have not assented to the last answer of the witness as being proper legal evidence.

The Court: Had you not better stand on your

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objection?

Mr. Morris: Very well.

The Court: The Court overrules it and enters an exception.

Mr. Morris: That is to the preceding one.

The Court: Yes.

Mr. Morris: I withdraw the objection as to whether he did get certain figures from a certain book, and I do not care whether he did or not.

The Court: I just want to keep the record straight.

Mr. Morris: I think we are straight. My objection to this question is this, whether this is the page of this book, where he got certain figures, and I have no objection to that.

The Court: Very good. That was the question?

Mr. Bernays: Yes.

The Court: Very good.

By Mr. Bernays:

RDQ. Were these among the figures that were consulted by you and us last night? A. Yes, sir.

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Mr. Bernays: I offer this table in evidence, being table X at page 1060, the Biennial Census of Manufactures, 1927, printed by the United States Government Printing Office in Washington, D. C.

Mr. Morris: I object. I object for two reasons, first, that it is not a proper basis or foundation for the ascertainment of alleged damages in this case; I object, secondly, because even if those figures could be looked at, it would furnish no basis for arrival at any damages other than the purest speculation in this case.

The Court: I recognize the force of the objection. For what it is worth it is admitted subject to the final ruling of the Court and to the charge of the Court to the jury.

Mr. Bernays: Thank you, sir.

Mr. Morris: I do not know whether I want an exception or not, but will your Honor give me one?

The Court: Certainly. Let an exception be entered to the ruling.

(Received in evidence and marked "Plaintiff's Exhibit No. 50".)

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Mr. Bernays: Gentlemen, this table from the Biennial Census of Manufactures for 1927 sets forth that in 1923 there were produced 623,146 loud speakers for use in radio of the value of upward of $5,600,000, and that in that same year there were produced head sets for use in radio to the number of 1,781,793, and to the value of $5,345,380.

It shows further that in 1925 there were produced loud speakers for use in radio of the number of 2,844,652, to the value of $18,955,916, and head sets in that year to the number of 1,352,442 and of the value of $2,164,529.

It shows that in 1927 there were produced loud speakers for use in radio to the number of 2,458,785 of the value of $18,838,751 and head sets for use in radio to the number of 267,730 and of the value of $319,173.

By Mr. Bernays:

RDQ. You made mention, Mr. Hollister, of figures with respect to interior telephone sets. I show you Volume X of the 14th Census of the United States setting forth a

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census of manufactures for the year 1919, and direct your attention more particularly to page 951 of that volume, Table XIX and in that table the data with respect to interior systems of telephone apparatus. Was that among the figures considered and consulted by you and us when we went over this matter? A. Yes.

Mr. Bernays: I offer that table in evidence.

Mr. Morris: I have the same objection and the same exception.

The Court: I recognize the force of the objection but I make the same ruling.

(Received in evidence and marked "Plaintiff's Exhibit No. 51".)

The Court: It is all subject to the ultimate ruling of the Court and the charge to the jury.

Mr. Bernays: On the substantive points, sir.

The Court: Yes, as to whether or no all this census stuff has anything to do with this case.

Mr. Bernays: Yes, I quite appreciate that, sir. This table last marked shows the manufacture in 1919 of interior telephone systems to the number

of 173,799 and to the value of $1,578,778.

By Mr. Bernays:

RDQ. I show you now the volume of the Biennial Census of Manufactures for 1927, published by the United States Government Printing Office at Washington, D. C. and call your attention to Table VI at page 1058 of that volume having to do among other things with telephone apparatus and call your attention to the figures appearing thereon with respect to interior systems, and ask you whether those were among the figures that were considered in arriving at your figure of this morning? A. Yes.

Mr. Bernays: I offer it in evidence.

The Court: The census for what year?

Mr. Bernays: The volume is for 1927. The figures are for 1923, 1925 and 1927 in the table that I refer to, also 1921.

Mr. Morris: May I have the same exception?

The Court: Same ruling and an exception entered.

(Received in evidence and marked "Plaintiff's

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Exhibit No. 52".)

Mr. Bernays: As I understand it, and I want to be sure that I have the record clear on the merely technical problems of proof, as I understand it no objection is being made to the proof of these volumes as being the publications which they have been described to be on the record.

Mr. Morris: I have not the slightest idea whether they are or not. I understood the burden of establishing them is on the person using them.

The Court: They are all issued by the Printing Office of the United States?

Mr. Bernays: They are issued by the Printing Office of the United States. Each of them is printed and published pursuant to a statutory mandate of the United States. We have not troubled to have them certified——

The Court: You are not questioning their authenticity?

Mr. Morris: No. I raise no question about these documents that have been referred to as having been published or printed by the Government Print-

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ing Office at Washington under governmental authority.

The Court: The authenticity is admitted.

By Mr. Bernays:

RDQ. Mr. Hollister, you have seen and have heard read or described in court Plaintiff's Exhibit No. 38 which

is the memorandum of July 27, 1926, from L. O. Parker to C. E. Wilson with respect to reduction of prices of the equipment to Fisher Body Corporation upon Stentor equipment, have you not? A. Yes, sir.

RDQ. Let me ask you, when for the first time did you see that writing? A. Late Saturday night.

RDQ. Here in Wilmington? A. Yes.

RDQ. You had never theretofore seen it? A. No.

RDQ. And you also went over, after court yesterday, did you not, a photostat of the writing of which the typescript copy on white paper was today marked Plaintiff's Exhibit No. 44? A. Yes.

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RDQ. And did you observe in Plaintiff's Exhibit 38 the suggestion "that it would be advisable for us to reduce the price of the equipment to Fisher Body enough to bring the profit down to a point where it would not be necessary to pay any to this outside concern"? A. Yes, sir.

RDQ. And did you observe the further statement in that exhibit that the "Last cost figure received by the writer from the Cost Department of this equipment is $9.89, while we are at present charging them," and that is to say Fisher Body,—"$14.87 per set"? A. Yes, sir.

RDQ. And you have also considered, have you not, and heard adverted to in court this morning Plaintiff's Exhibit 42, being the memorandum of May 10, 1928, to which are attached statements of new prices effective May 1, 1928, upon the Stentor Autophone to Fisher Body Corporation, and Fleetwood Body Corporation, upon which it appears that the new prices are $10.75 per set? A. Yes, sir.

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RDQ. And you have also observed, have you not, the following set forth in Plaintiff's Exhibit 41, which is the memorandum of December 19, 1929, from Mr. Cooper to Mr. Carroll, in which Mr. Cooper encloses a Stentor state-

ment and makes the following statement: "The occasion for some profit in this particular quarter was that we sold a small amount of equipment to some outside companies including Studebaker, Franklin and Kissell"? A. Yes, sir.

RDQ. Have you upon the matters set forth in those exhibits, including the statements as to policy and conduct with respect to prices, the statements as to actual prices and so on, tried to make the best computation that you could of the amount by which, by reason of those facts, Stentor received lesser profits for the years 1928, 1929 and 1930, than it would have received but for those facts? A. Yes, sir.

RDQ. Will you state, please, what the figure is arrived at by you in that respect?

The Court: This is based on fact and not state-

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ment?

Mr. Bernays: On the facts appearing in those exhibits.

Mr. Morris: May I have an objection to this question? It seems to me we are getting into the field of speculation or in the realm of speculative damages the same as hitherto.

The Court: The number of sets sold to the Fisher Body is shown.

Mr. Bernays: The number of sets is computed, and they are not broken down on those writings into sales to Fisher Body or Fleetwood Body or other parties as to non-performance, except in so far as it is manifest from Plaintiff's Exhibit 41 what happened during that period of time, because that exhibit, which is dated December 19, 1929, in that exhibit the writer takes particular occasion to call the attention of the addressee to the fact

that the occasion for some profit in this particular quarter was that "We sold a small amount of equipment to some outside companies, including Studebaker, Franklin, and Kissel," so that he is himself characterizing the prior sales and the lack of profits therein, divisible or distributable to Stentor, as being due to the fact that they were not making sales to outside companies.

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The Court: But during this period there were so many sets sold to Fisher Body?

Mr. Bernays: Yes, sir.

Mr. Morris: We are not in agreement on that. I do not say that my friend is not right, but I think he is not right.

Mr. Bernays: I will be glad, sir, to have the witness state upon the record not only the figure that he arrived at, but exactly how he arrived at it, so that it will be subject to Judge Morris's scrutiny in all respects.

Mr. Morris: I do not recall where the number of sets sold to the Fisher Body have been put into this record. I do not say they have not been. I do not recall it, but I think they have not been.

Mr. Bernays: Judge Morris is quite right. I have not made proof, and I thought I had said that in Court before, I had not made proof of sales broken down separately to Fisher Body or the Fleetwood or to outside companies except to the extent that we are able to ground an inference upon the statement in that memorandum of 1929 in

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which explanation is made for the fact that in one-quarter they made a small profit, the explanation being that in that quarter they sold to some outside companies.

Mr. Morris: Then it is now conceded that there is no basis in fact for this, or the basis in fact is not shown. This assumption is based on an underlying assumption and consequently is speculative.

Mr. Bernays: I make no such concession. I am predicating this question and taking the answer on the facts as they do appear, and of course not upon any foundation that there is no basis of fact.

Mr. Morris: The failure to break down when the unknown factor is combined even with known factors, that makes the whole thing or total unknown, and the witness is now about to speak with respect to a result that he has arrived at from adding two things, (a) which is known, says he, and (x) which is wholly unknown, and he gets y, likewise wholly unknown, and therefore speculative I submit.

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The Court: Will not your cross examination illustrate perfectly whatever frailty there is in this examination?

Mr. Morris: It might be possible, but I submit that before it is admissible prima facie, it ought not to be speculative.

The Court: Are you basing your answer on the letters already admitted?

The Witness: Letters and figures, yes, sir.

The Court: Already admitted?

The Witness: Already admitted.

The Court: Take the answer.

Mr. Bernays: I want to be sure so that Mr. Hollister can proceed properly. Which way are we proceeding? Are we taking a figure or a figure and a description of the method?

The Court: Propound your question.

By Mr. Bernays:

RDQ. Will you state, please, what figure you arrived at in that respect as a result of the computations which you tried to make, and what I want is simply the figure of the ground by which, as nearly as you can determine,

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Stentor received less from Klaxon during the three years 1928, 1929 and 1930, than it would have received but for the facts and practices set forth in those documents? A. Stentor received less than it should have received with these documents or the figures set forth in these documents of $23,424.84 during the years 1928, 1929 and 1930.

RDQ. And that is as nearly as you can determine it, Mr. Hollister? A. As nearly as I can determine it, yes, sir.

RDQ. Mr. Hollister, you will remember that upon one of the exhibits marked yesterday which was a report of Haskins & Sells, dated April 8, 1918, the United Motors Corporation, it appeared that at that date of April 8, 1918, Stentor had unfilled orders on hand for approximately $2500 for automobile equipment, and $205,000 for Navy type ship telephones. You will remember that the contract in suit is dated May 20, 1918. To the extent that those orders for automobile telephones remained unfilled on May 20, 1918, what was done with those orders by Stentor? A. All those orders were handed over to Klaxon.

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RDQ. With respect to so much of the $205,000 of contracts unperformed for Navy type of marine telephone installation, what was done with so much of those contracts as had not been performed at May 20, 1918? A. They were given to Klaxon, handed over free of charge and no charge made for them at all.

RDQ. And you will remember that during the seven

and a half months approximately from May 20, 1918 until December 31, 1918, as appears from Plaintiff's Exhibit 45, the net sales of Stentor product by Klaxon, aggregated the figure of $163,515.12? A. Yes.

RDQ. And as further appears from the same exhibit, Mr. Hollister, the final adjusted figure of profits for those seven and a half months made by Klaxon during the year 1918, and distributable between Klaxon and Stentor in the proportions provided in the agreement in suit, were $61,430? A. Yes.

RDQ. Of which one-half was distributable to you? A. Yes.

RDQ. And when I say "you", I mean Stentor, of course?

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A. Yes.

RDQ. Giving the Stentor proportion of profit for those seven and a half months, as I make it, $30,715? A. Yes.

RDQ. Mr. Hollister, you were examined yesterday as to the efficiency or inefficiency of your business management, do you remember that? A. Yes, sir.

RDQ. And as to the experience or lack of experience in business management of Mr. J. L. Spence? A. Yes, sir.

RDQ. And do you remember being asked whether you were putting your judgment, the judgment of yourself and your fellow stock brokers, I think was the expression used, as to what business should have been done by Klaxon against the judgment of Klaxon itself? A. Yes, sir.

RDQ. And generally you remember you were cross examined about the efficiency with which the business of Stentor was conducted before it was turned over to Klaxon? A. Yes, sir.

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RDQ. Would you say that Klaxon, under this agreement, should have done during the years after 1918, with respect to this product, in each full year thereof, at least

as well as your little company was able to make it possible for Klaxon to do for the seven and a half months' period? A. Yes, sir.

The Court: Shall we pause here?

Mr. Bernays: Yes, sir.

The Court: The Court will recess for five minutes.

(After a short recess.)

By Mr. Bernays:

RDQ. Have you made a computation with further response to Judge Morris's question of what would have been the profits distributable under the agreement by Klaxon to Stentor upon the basis of Klaxon doing in each remaining year of the agreement after 1918 what was done in the seven and a half months of 1918? Just tell us yes or no. A. Yes.

Mr. Morris: I object to even a yes or no because

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it is so highly speculative as to whether or not if Klaxon had done during subsequent years what it did at that time. It furnishes no basis for damage.

The Court: The question is have you made a computation.

Mr. Bernays: Yes, sir.

The Court: And the objection is overruled. Let an exception be entered.

Mr. Morris: I think you are right.

The Court: If there be frailty in this, if you think it was all superseded, it will be brought out in cross examination.

By Mr. Bernays:

RDQ. Will you state, please, what that computation shows? A. The final figure?

RDQ. Give us your computation and the final figure, Mr. Hollister.

Mr. Morris: May I have an objection and exception to this one?

The Court: Oh, certainly.

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Mr. Bernays: You may answer.

A. This is a different approach to the same subject of profits than Klaxon could have made.

The Court: On the basis of the same demand?

The Witness: On the basis of this suit.

A. (Continued.) From May 20, 1918 to December 31, 1918, Klaxon made sales of a little over $163,000. They reported a profit on that of $61,430 and those figures were shown to you on Plaintiff's Exhibit 44. All of these profits were made on business that we had turned over to them, profits during that period between May 20, 1918 and December 31, 1918. All those profits were on business which we turned over.

So I am taking only those seven and a half months of 1918 as the standard for each of the remaining 13 years of the agreement, in spite of the fact that this is only seven and a half months' earnings and not a full year. In other words, I do not want to exaggerate or over-estimate.

The 13 years to which I refer are 1919 to 1931, both inclusive. Our share in 1918 from Klaxon was $30,715, as shown by this same statement here. If you multiply

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those figures of our share for that seven and a half months' period, which I am taking as a criterion, by the 13 remaining years, the total is $399,295. All that we got during these 13 years was $40,000, and that includes the $30,000 which we originally got from our business of the first seven and a half months.

RDQ. You said "includes." Did you mean includes or excludes? A. Pardon me, I am sorry to mix you up. All that we got during the remaining 13 years, that is, from 1913 to 1931, inclusive, was $40,000. The difference between the figure I just gave you, multiplying the $30,715, the money we got in 1918 from Klaxon, as being $399,295, and taking the $40,000 which we got from them during these remaining 13 years, the difference is $359,295.

* * * * * * *

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Re-cross examination by Mr. Morris:

RXQ. The period in which the radio business was most "rampant",—for want of a better word, was when? A. As I remember, from the investigations I have made, the business began to get into volume somewhere around 1922, and I guess about 50,000,000 sets today, and so I guess it has gone right on up until today.

RXQ. So that in 1922, 1923, 1924 and 1926, is where you would possibly fix the very profitable period? A. The dates which I have referred to were 1922 to 1927.

RXQ. Then one engaging in the manufacture of these devices for radio at that time— A. What is that?

RXQ. Then your position is and your testimony is, as I understand it, that one who knew his business, who was engaged in that business at that time, could have made a profitable business?

* * * * * * *

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RXQ. Let us go to your testimony with regard to damages. Which way did you work, did you work to give some figures that would produce $1,000,000 or $2,000,000 or $40,000,000 or $20,000,000, or did you take the factors and arrive at the result? A. The peculiar thing is that the first of the representations I made was that it came out exactly to $1,000,000, and I was very much surprised.

RXQ. Yes, you were not working at all for that result, were you? A. No, sir.

RXQ. Then it was most peculiar? A. It struck me so late last night when I was going over this thing.

RXQ. There was nobody furnishing you with those factors which enabled that result to come out? A. All these books that you have seen, and I have talked with counsel of course.

RXQ. And the factors were selected by you or selected by counsel? A. All of us talked together over the figures.

RXQ. Any differences during the discussions? A. Do

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I have to tell you what my counsel and myself said?

RXQ. You have told me that you read—or you do not have to tell me, and you consider it privileged if you want to, and if you consider it privileged and tell me it is privileged, and you do not want to tell me, then I will withdraw the question.

M. Bernays: Mr. Hollister, if there is any question of privilege, I advise you upon the record to waive and disregard it and tell Judge Morris whatever he wants to know about how you got those figures together.

The Witness: Fine, and I am very glad.

RXQ. The privilege is yours and not counsel, and you may do what you please with that. Are you now waiving

the privilege or shall I stop? A. Yes, I waive the privilege and I will tell you exactly where I got it.

RXQ. Let us have it. Were the factors that arrived at this sum suggested to you by your counsel, or were they arrived at by you? A. We all got together and we got the

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figures from these various books that you have seen and we found that it was approximately 10,000,000 receiver sets in 1923, 1925 and 1927, and we called that in round figures 10,000,000. We carried the question forward after considerable looking through books to find additional figures if we could, and that is the figure which we finally arrived at.

Mr. Bernays: Judge Morris, may I suggest that you bring out, as long as you have embarked on this——

The Court: Just a moment. This is cross-examination.

Mr. Bernays: I appreciate that and I am not going to interpose an objection, but I will ask Judge Morris to bring out if he will, and only if he will, who was there when these discussions were being had.

Mr. Morris: Perhaps I may when I get through with the line of thought that I have.

By Mr. Morris:

RXQ. So that these figures that you have arrived at and talked to us about this morning, you took a Govern-

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ment book, a census book, and then from your manufacturing experience and selling experience and counsel's manufacturing and selling experience, you assigned so many of all of these instruments that were made in Amer-

ica during those years to Klaxon, is that right? A. I assigned a certain percentage to Klaxon.

RXQ. You assigned a certain percentage to Klaxon? A. Yes.

RXQ. You said Klaxon should have made that percentage? A. No, I did not say that.

RXQ. What did you say? A. We chose that figure as being in our mind something that Klaxon could easily have done.

RXQ. That Klaxon could easily have done? A. Yes, sir.

. . . . . .

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RXQ. So that you assigned, as I understand you, 10 per cent. of certain census figures to Klaxon as their proper reduction and sales for certain years? A. 10 per cent. of certain census figures and then estimates for certain years.

RXQ. After taking the census figures for certain years, then you and your counsel made estimates for certain

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other years of what the production should have been for the United States? A. My counsel, also Mr. Langley, who has considerable knowledge of that matter, sat in with us, one of our witnesses.

RXQ. Fine. So that you and your counsel and Mr. Langley turned to certain census figures for certain years and assigned to Klaxon its portion or 10 per cent. of that. You had no notion as to what portion it actually did make and sell, did you? A. Klaxon?

RXQ. Klaxon? A. Make and sell telephone receivers for radio business?

RXQ. Yes. A. My knowledge is that they did not do it at all.

RXQ. So that you merely assigned to Klaxon 10 per

cent. of what, the radio transmitters or radio receivers? What was it you did assign to it? A. There were 10,000,000 radio receiver units for use in radio according to the census figures in 1923, 1925 and 1927 manufactured in those census years.

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RXQ. So that you assigned to Klaxon 10 per cent. of what you found in the books printed by the Government were manufactured during certain years? A. Those years, and including other years which were not in the books.

RXQ. And then for the years that were not in the books you just arbitrarily assigned them a certain amount? A. Mr. Langley has certain figures. You have asked me this question before as to how much proof is in. Mr. Langley will testify later, but from the figures he gave me, and we altogether in conference, gave this statement.

RXQ. So that your estimates this morning have been based not alone on census figures, but on information that you got from Mr. Langley? A. I so stated, yes.

RXQ. I am asking you now? A. Yes.

RXQ. And then your counsel made some contributions by way of suggestions or figures, did it not? A. I think we all talked the matter over very carefully, yes, sir.

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RXQ. So having assigned to Klaxon that it should have had 10 per cent. of that business, what did you next do? A. Then——

RXQ. Can you not tell me without looking at what you wrote out last night? A. I will try to if you wish it.

RXQ. I do not care whether you do or not, but I just asked you? A. I will try to.

RXQ. As you like. What did you do next? A. I then set a price or the cost to Klaxon of this receiver as being $1.

RXQ. You assigned to Klaxon that it could have built and sold that receiver for $1? A. Not sold for $1, built it for $1.

RXQ. It could have built it for $1? A. I said so, yes, sir.

RXQ. It could have built it for $1? A. Yes, sir.

RXQ. So that you fix the manufacturing cost for 1922, 1923, 1924, 1925, 1926 and 1927, is that right? A. Yes, sir.

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RXQ. After conference with Mr. Langley and your manufacturing experience? A. No, sir, we had certain other figures there from the Electrical Industries Company.

RXQ. That you have not told us about? A. No, you have not asked me about it.

RXQ. So that your figures were based not only on what you have told us about, but some things that you have not told us about? A. I said figures, yes, certainly, and I told you other figures for those years, and for the whole time.

RXQ. On the manufacturing cost did you get that out of the United States Census? A. The $1?

RXQ. Yes. A. I think I told you they were from figures from the Electrical Industries Company who furnished these units to Klaxon and they also furnished them to the old Stentor Company way back in 1913 to 1918, the same company furnished them to us.

RXQ. Did you have any other figures which you have

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not told us about? A. Yes, I did. I put $1 more on top of that.

RXQ. For costs? A. On top of that.

RXQ. For costs? A. What is that?

RXQ. For manufacturing costs? A. No, I have already given you $1 for manufacturing cost, and I put one extra dollar on it.

RXQ. And what did you put the extra dollar on for? A. For profit.

RXQ. For profit? A. Yes, sir.

RXQ. So that the three of you sitting around a table last night assigned 10 per cent. of the radio industry of America to Klaxon from 1922 to 1927, and three of you sitting around that table decided what that cost would be per unit, and then you decided what the cost would be or the profit would be, and then you decided that on the result of the conference of the three of you that you arrived at a certain figure of damages in this case, is that right? A. There were four of us, and that is merely

technical.

By Mr. Morris:

RXQ. Then the four of you? A. There were four of us. Can I have that exhibit of this morning, and it was here on the desk and it is gone. I tried to be very conservative, Judge Morris.

RXQ. I have no doubt of that. A. And I set $1 above the cost to you. I find that you sold, and this is Exhibit 49, receiver units for $3.70 to Remy. If we use the $3.70, the figure would have been way over $1,000,000, so that we assigned $1 extra and made it $2.

RXQ. You can get a lot of figures, which if multiplied together, will give you $1,000,000. A. This is your own records from the Remy Company stating the price.

RXQ. I asked you if you could get a lot of figures which if multiplied together would give you a million dollars? A. Doubtless.

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Mr. Morris: May I put on the record at this time the following motion, a motion to strike out all of the witness's testimony with respect to damages predicated upon the census or the hearsay testimony and other facts which he has testified about. I am not asking for an immediate decision, but at your Honor's own time.

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JOSEPH J. GRAF, was called as a witness on behalf of the plaintiff, and having been first duly sworn, testified as follows:

Direct examination by Mr. Bernays:

Q. Mr. Graf, what is your employment? A. I am the Telegraph and Telephone Engineer of the Delaware, Lackawanna & Western Railroad.

Q. And how long have you held that post or office with the D. L. & W.? A. Since 1901.

Q. Prior to about 1907, what system or method of train dispatching was used upon the D. L. & W.? A. Telegraph.

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Q. Did the D. L. & W. install any of the products upon its lines for use in dispatching of trains? A. We did.

Q. Do you remember whether you put in your order or requisition for all installations at one time or whether you did that over a period of time? A. Period of time.

Q. Did you try out the product upon any actual installa-

tion as operated and worked on your system, Mr. Graf? A. We did.

Q. Was the testing of that apparatus and of its working something which was within the scope of your duties with your railroad? A. Yes, sir.

Q. And did you personally have anything to do with testing out the working of the product? A. Oh, yes.

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Q. Did you observe the working? A. Yes.

Q. Will you tell the Court and the jury, please, whether the product worked satisfactorily in respect of the reproduction of the voice when it was used as actually installed on the railroad?

Mr. Morris: I object to the question as leading.
The Court: Ask without leading.
Mr. Bernays: Very good, sir.

Q. Will you tell us how the product worked when installed upon the road and actually used upon the road? A. Very satisfactory. The dispatchers were very enthusiastic as to the operation as compared to the original head receiver.

Q. Did you ever yourself hear the reproduction of the voice at the receiver mechanism as actually installed and operated on your railroad? A. Continuously.

Q. Will you state to the Court and jury, please, how that reproduction was in respect of quality? A. Well,

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the reproduction was accurate. If the speaker had a poor voice, or what we call a "whispering voice," the dispatcher had to caution him to speak up, as he would on an ordinary telephone. Some voices have considerable larynx, and some don't, and we have the same difficulty today that we always had of people talking on telephones, they do not transmit, and others do.

Q. Was the reproduction of the voice clear or unclear? A. It was a true reproduction of the voice spoken.

Q. Have you at our request checked, as nearly as may be after this passage of time, to ascertain for us over what mileage the Stentor products were installed upon your railroad, Mr. Graf? A. Yes, I have.

Q. And have you upon our request set forth the results of your effort upon a memorandum which I show you (handing)? A. Yes.

Q. And you sent that memorandum to us? A. Yes.

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Q. You have a copy of that in your possession? A. Yes.

Q. What was the total mileage, Mr. Graf, over which these Stentor instruments were installed on the D. L. & W.? A. The final installation comprised two divisions with a total of approximately 210 miles of railroad.

Q. Was the installation made in all cases under your supervision, Mr. Graf? A. Yes.

Q. Did you test out the installation? A. Yes.

Q. Do you remember when the installations began to be made? A. On the first circuit, in the latter part of August, 1913, into September of 1913. I think the job was completed about the 20th or 25th day of September.

Q. Over how long a period were the installations made? A. The first circuit was under observation approximately three weeks, I think, when the management decided to proceed with the second circuit.

Q. How long did these installations continue to be used

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upon the D. L. & W., Mr. Graf? A. I think it was around 1921.

Q. Were they then replaced? A. They were substituted.

Q. And what was substituted for them? A. Western Electric development of the same art.

Q. Was the Western Electric system a loud-speaking system? A. It was.

Q. Do you know whether it was an ordinary telephone system or a system using a radio amplification? A. It used the newly developed DeForest audion tube for rectification and amplification of potentials.

Q. And at that time the Stentor installations were removed, Mr. Graf? A. They were.

Q. Did the Western Electric system have a transmitter? A. No, they didn't require a transmitter.

Q. What about the receiver? A. They did have a receiver.

Q. Did they furnish them as a part of the system? A. They did.

Q. After the Western Electric system had been installed, did you at any time try using a Stentor receiver upon that system? A. We did.

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Q. Did you observe the workings of the Stentor receiver when put upon that system? A. Oh, yes.

Q. Personally? A. Yes.

Q. Will you state, please, to the Court and to the Jury, how the Stentor receiver operated when put in on the Western Electric system? A. Equally as well as the Western Electric.

Mr. Bernays: Your witness, Judge Morris.

Cross examination by Mr. Morris:

XQ. If I understood you correctly, Mr. Graf, the Stentor devices were installed on 210 miles of the D. L. & W.? A. They were.

XQ. That was the total? A. That was the total.

XQ. What was the total mileage of the D. L. & W. system? A. About 900 miles.

XQ. So that notwithstanding, it was installed in the fall

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of 1913. The total installed was less than one-fourth, or approximately only one-fifth of the system? A. That is right.

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WALTER L. ECKHARDT, was called as a witness on behalf of the plaintiff, and having been first duly sworn, testified as follows:

Direct examination by Mr. Bernays:

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Q. Where do you live, Mr. Eckhardt? Where do you live? A. Philadelphia, Pennsylvania.

Q. What is your business, sir? A. I am an industrial and merchandising consultant.

Q. And will you on your part try to keep your voice up so that you can be heard at the end of the jury box? In 1922 did you have anything to do with the organization of a company called General Radio Corporation? A. I did.

Q. Were you one of the organizers of that company? A. I was the organizer, president, and general manager.

Q. You mean that you became the president and general manager after the company got into business operations? A. Correct.

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Q. Mr. Eckhardt, was the name of your company, General Radio Corporation, at any time changed after its organization? A. It was. About a year or so later we changed to the name of Music Master Corporation.

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Q. Mr. Eckhardt, do you know Mr. J. L. Spence? A. W. T. Smith? J. L. Spence.

Q. "Spence" was the name. A. I thought you said "Smith", pardon me. Yes.

Q. Do you know him? A. Yes, sir.

Q. Do you remember when you met Mr. Spence? A. I first was contacted by one of my associates and directors, Mr. W. T. Smith, of Harriman, who told me of Mr. Spence and asked me if I would see Mr. Spence, that he had an item that he thought ought to interest me. That was along about the latter part of January, '25, perhaps early February, I am not certain in my date, but it was about that time. A short while later I agreed to see Mr. Spence.

He came down and saw me and told me what he had to show me. We discussed the matter, and he went back to New York to bring me down samples to further convince me that he had something I wanted.

A short time later he came down. He had a sample Music Master speaker equipped with a unit that he had of his own. He had one of his own speakers also

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equipped. He asked me to make a test on it, which I did in my laboratory at 10th and Cherry Streets. We had a speaker of the type you see here which we figured was a pretty good one.

Q. Where did you get that speaker to which you are referring? A. Out of my own stock.

Q. And that was one of your regular Music Master loud speakers? A. It was a regular run of speaker, but we knew it was a good one, and we connected the two speakers in the laboratory to a throw switch, where you could almost hit the same key, the same note, at the same moment, and we had a test, we would play first one and then the other, and we were supposed to tell which we liked best.

Q. Mr. Eckhardt, about how big was the laboratory room in which this test occurred? A. About sixteen by twenty.

Q. Do you remember physically the locations of the radio receiving set that you were using and the loud speakers in relation to you and Mr. Spence? A. We were

about twelve foot away from the bench.

Q. Were the loud speakers connected into a radio receiving set? A. We had them both into a receiving set and connected with a phonograph.

Q. Can you remember what type of sound was tested in respect of reproduction over these two loud speakers? A. We had the spoken voice, singing voice, and we had instrumental music.

Q. Did you get those sounds over the radio or by the use of a phonograph, or both? A. Both.

Q. Will you state to the jury and the Court, please, the results of the test as compared between the two loud speakers in respect of their performance?

Mr. Morris: We have no—I object for this reason, there is no evidence in this case showing the structure of the instrument or set or so-called loud speaker that they were testing other than the Music Master speaker, so that I submit that if this is answered it will give to us no information whatsoever with regard to the issues in this case.

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Mr. Bernays: I am bound to concede, sir, in fairness to my learned friend, that at this stage of the proof the lack of connection is a point which is well taken. We ask that this be taken subject to connection, because the next thing we shall do after Mr. Eckhardt has completed his testimony will be to provide that connection by the reading of a deposition at the taking of which Mr. Steel was present and cross-examined.

The Court: You are going to follow it up to establish its pertinency, are you?

Mr. Bernays: Yes, sir, and I shall make the connection the lack of which Judge Morris has called to your attention.

The Court: Very good. If you do not, of course, it should not be heard.

Mr. Bernays: Yes, sir.

The Court: Very good.

Mr. Bernays: Might I have the question read back? If you doubt whether you hear the question please tell me so, won't you?

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(The question was repeated by the Reporter, as follows:

"Q. Will you state to the jury and the Court, please, the results of the test as compared between the two loud speakers in respect of their performance?")

A. There was a decided difference. While we thought we were pretty well qualified to judge tone quality and fidelity, I didn't know at the time of the test which unit, or which speaker contained which unit, so I was out in

the blind test to pick which might be the better one of the two, because we were always eager to help our business and find something better if possible, and it was inconceivable to me that someone else would bring something better to me than what I had, but, frankly, after the test was over, then and then only did I know which was my unit and which was the other fellow's unit, and consequently it was so impressive that I asked him a lot of questions about his unit. I asked the price. He was a little indefinite about that. I asked him about deliveries, asked him to come down to my office from the fourth

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floor down to the second of my building, and we discussed for a few minutes the plan for him to come back and find out the price, and find out the delivery schedule that he might be able to work up to.

He asked me frankly what I was paying for the unit that I had been using, and in order to save time I very frankly opened up and told him I was paying $2.06 at that time. He said, "We can supply a unit, I think, at the same price."

I says, "You go and find me a schedule of what you can make them for, and then I will talk business with you." I says, "Unfortunately, you didn't come around here a month ago, when I placed a very substantial order".

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Q. Did you thereafter follow up the matter or attempt to follow up the matter of procuring a delivery schedule and production upon the unit that you heard demonstrated? A. Not hearing from Mr. Spence——

Q. Will you speak up? A. Not hearing from Mr. Spence, who promised to get the information back to me as quickly as he could talk to his people about it, I contacted Mr.

Smith, who was an officer of my company, on the board, and Mr. Smith told me that he would try to find out from Mr. Spence what it was all about, and what schedule they could make up for us, but from that time further I heard little or nothing more about it.

Mr. Bernays: You may examine, Judge Morris.

Cross examination by Mr. Morris:

Q. Did Mr. Spence say to you who made the unit which he submitted to you? A. No, I assumed that he had it under his own control. I don't know who made it.

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Q. Did he say to you that he proposed to manufacture it personally or that the Whiteland Manufacturing Company was to make it? A. He didn't tell me that, and I didn't ask him.

Q. He didn't tell you who would or could supply the unit that he submitted to you? A. I didn't deem it necessary to inquire about that, because Mr. Smith knew him and knew his contact.

Q. This test lasted how long, Mr. Eckhardt? A. Oh, I would say from a half to three-quarters of an hour.

Q. That test was with one unit on one day, continuously, for—more or less continuously, for that length of time? A. No, sir.

Q. What? A. Two units were on simultaneously, and then throw from one to the other.

Q. Yes. One of the two units that you are speaking of was a Music Master unit? A. Music Master unit was in one of the speakers.

Q. That is right. A. And Mr. Spence's unit was in the

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other.

Q. What I had in mind, Mr. Eckhardt, was that there was but one Spence unit? A. That is right.

Q. And your test of that Spence unit was a duet with a Music Master,— A. That is right.

Q. —as well as a solo by the Spence unit and a solo by the Music Master? A. That is right.

Q. The Spence unit was tested just during that one hour, so to speak, or half hour, whatever it was? A. During that term, yes.

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By Mr. Morris:

Q. You spoke, Mr. Eckhardt, of an order that you gave for three hundred thousand loud speakers? A. That is right.

Q. Did you perform that contract on your part? A. I explained before we had taken of that one hundred and twenty-two thousand.

Q. And then you breached the contract as to the remainder? A. Apparently. The receiver settled that.

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JESSE LEE SPENCE, witness for plaintiff, 465 Ocean Avenue, Brooklyn.

"Q. Are you one of the dissolution trustees, Mr. Spence, of the Stentor Electric Manufacturing Company, Inc.? A. Yes."

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By Mr. Bernays:

"Q. I think you said, Mr. Spence, at the last time that after some years, but you did not know how many years, this type of installation, this Klaxon-Stentor type of installation, was taken off the United States vessels. Do you know whether any other loud speaking installation was thereupon put upon the vessels as a matter of current practice? A. Oh, yes.

"Q. Do you know what kind? A. They had a larger horn and they were operated by vacuum tubes. They gradually replaced these as they came in order and these

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were taken off and the others put in their places.

"Q. Is the vacuum tube the same thing that is known as the amplifying tube? A. Yes."

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"Q. Mr. Spence, I show you a device consisting of a stand and wiring in the stand and a metal horn which

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fits into the groove of that stand, and a wooden horn which fits into the metal horn, and ask you if you recognize what that entire assembly is. A. It is the Music Master radio loud speaker.

"Q. And is so marked with a name plate on the stand, Mr. Spence? A. Yes.

"Q. Is that correct? A. That is correct.

"Q. And is so marked with an imprint upon the inside of the wooden horn, Mr. Spence? A. Yes, that is correct.

"Q. And if you do not mind getting up for a moment, it is so stamped also on the metal band around the narrow end of the wooden horn? A. Yes, it is.

"Q. Is that the Music Master loud speaker as it was at this time in the fall and winter of 1924 and early 1925?

A. I would say it was one of the loud speakers in use

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at that time and sold at that time.

"By Mr. Steel:

"Q. Do you know that this is one of the Music Master sets which was manufactured and sold during the years which Mr. Bernays specified, or is that just an impression? A. I have no way of knowing except the impression I get that it is a duplicate of the one I had used in the demonstration I made.

"Mr. Bernays: I think that was as far as Mr. Spence's prior statement had gone, Mr. Steel.

"Mr. Steel: I do not think his prior statement went quite that far.

"By Mr. Bernays:

"Q. In 1924 did you take the Music Master unit apart to see what its construction was? A. I did.

"Q. And at that time did you familiarize yourself with its construction? A. Yes.

"Q. Attending for the moment particularly to the stand,

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is that where the receiving unit was in the Music Master loud speaker?"

The reference being to Plaintiff's Exhibit 73.

"A. As we call it, the loud speaker unit was located in the base.

"Q. And what was the unit of the Music Master loud speaker as you ascertained it at that time? A. It was the same as an ear phone, a single ear phone radio receiver, adapted to this use.

"Q. Was it a receiver with a diaphragm clamped at the periphery or a free moving diaphragm? A. What do you mean by clamped?

"Q. What was it in comparison to the ordinary telephone receiver, Mr. Spence, did it differ in any material respects? A. Well, it was practically identical with the watchcase receiver that we had then had in ordinary telephone use.

"Q. Now you referred to an experiment that you performed, in 1925 I think you said, here at New York City with the Music Master loud speaking set and the Music

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Master loud speaking set with a Stentor loud speaker in it. Will you describe, please, what that experiment was, spreading on the record what the two mechanisms were and how the experiment was performed? A. We purchased—or I purchased two then Music Master loud speaking horns—or loud speakers complete; and we took out the loud speaking unit from one of them and replaced it with a standard Stentor loud speaking unit.

"Q. Now when you say loud speaking unit, as you have just said twice in that last answer, you mean the mechanism that we have been referring to as the receiver? A. With a qualification.

"Q. What is the qualification? A. Which is very important. In the use of an ear phone receiver as an operating unit for a loud speaker, and when they adapted it to a horn——

"By Mr. Steel:

"Q. For radio? A. For radio.

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"The Witness (continuing): —that depended almost entirely on the horn itself giving out the loud

or audible sounds, because actually when the receiver was used without a horn it certainly was not a loud speaker. On the contrary the Stentor loud speaker unit with the free moving diaphragm was a loud speaker even without a horn, and that did not depend entirely on the horn itself to make it a radio loud speaker. Is that clear?

"By Mr. Bernays:

"Q. I understand, but I am afraid I did not make my question clear. In your answer, in the course of which I put my question, you used the expression loud speaking unit as being in the Music Master loud speaker assembly, Do you follow me? A. Yes.

"Q. And Mr. Steel has several times heretofore raised a question as to the definition of that expression, loud speaker unit—do I make myself clear? A. Yes.

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"Q. Now all I want to know is whether when you refer to the loud speaker unit in this Music Master assembly you are referring to the mechanism put into the base of the assembly which in effect was the equivalent of the telephone receiver. Is that what you mean by the expression loud speaker in that context?

"Mr. Steel: Mr. Bernays, I think that question was directly answered by Mr. Spence when he answered in the affirmative with the qualification which he stated.

"Mr. Bernays: Then if you consider that the record is clear I won't press it.

"By Mr. Steel:

"Q. As I understood you, Mr. Spence, when the Stentor loud speaking unit was used for purposes other than radio

the loud speaking unit itself emitted a sound which could be heard at a distance from it without the use of the horn, while when the loud speaking unit was embodied in

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the Music Master radio the loud speaker unit in and of itself would not transmit sound beyond the immediate vicinity of the loud speaker unit without the use of a horn? A. The qualification that I wanted to make in my answer was to this effect, that the receiver—radio receiver unit which the Music Master then used in their base of their loud speaking unit was merely one of a pair of ear phones adapted to the purpose in connection with the horn of giving out an audible sound; while the Stentor unit gave out an audible sound even though it was not attached to a horn.

"By Mr. Bernays:

"Q. Now to return to the experiment, because I think we have the term now defined, Mr. Spence, and because I interrupted you to get the definition of the term, will you tell us again just what you did with the two Music Master loud speaker assemblies and how you experimented and what the result was? A. We arranged a double

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throw switch.

"Q. I want you to start further back, right from the beginning. Did you use one of these Music Master assemblies just as you got it on the market? A. Yes.

"Q. Now what did you do with the other Music Master assembly? A. In the other Music Master assembly we took out the receiver unit in the base of the Music Master horn and replaced it with a standard Stentor loud speaking unit, wound for radio reception, but without any other changes, and reassembled the Music Master complete unit so that there was no difference in outward appearance

between the two sets. We then connected one to one side of the double throw switch, we will say the Stentor to one side of a double throw switch, and the Music Master original set, which we had not altered or touched in any way, to the other side of the double throw switch. From the center of the double throw switch coils led to a radio receiving set. So that standing in the room in which

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we were making the comparative test we could throw the current from one to the other, making a direct comparison.

"Q. When was the first time that you made that experiment, in New York or in Philadelphia? A. I made it in New York at the Electric Industries Manufacturing Company factory at 41st Street, and it was made at the request of Mr. Smith of the Harriman Company, who personally wanted to be satisfied of the things that I had told him regarding the superior qualities of the Stentor Company before he allowed me to go with his blessing to see the Music Master people in Philadelphia.

"Q. You said the superiority of the Stentor Company. A. The superiority of the Stentor loud speaking unit of course. There was no Stentor Company then.

"Q. And Mr. Smith did hear this experiment made? A. Mr. Smith heard the experiment, approved of the trip to Philadelphia to see the Music Master, and arranged for my meeting with Mr. Eckhart, the president of the Music Master Company.

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"Q. Now may I stop you for a moment. You told Mr. Carroll in your conversation with him in February of 1925 about this experiment that you had performed for Mr. Smith? A. I did.

"Q. Did you perform any experiment of the character that you have described at which Mr. Eckhart heard the comparative performances of the two instruments? A.

Well, first I went to see Mr. Eckhart directly with regard to obtaining orders for the Stentor loud speaking unit to be used in connection with the horn, and Eckhart himself said that if—no, I described to him the construction of it, with the free moving diaphragm, that with the use of this diaphragm there was no blare, as we called it then, there was no distortion, and there could not be distortion or blare, and Eckhart said, 'All right, Mr. Spence, if you have such an article as you have described to me with all those qualities, well, bring it down here and let me see it.'

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"Q. Did you then bring the instrument down? A. Within the next few days.

"Q. Now may I stop you here again. Did you tell Mr. Carroll in this conversation that you had with him in February of 1925 about this first conversation with Mr. Eckhart about which you have told us, do you remember? A. No, I do not remember that I did.

"Q. Well, now, to return to your second trip to Philadelphia, did you then perform an experiment for Mr. Eckhart of the kind that you have already described? A. I went to Philadelphia within a few days and took down the Music Master horn and base that had been equipped with the Stentor unit.

"Q. Was that the same one that you had used in your experiment here in New York at which Mr. Smith and Mr. Leach and Mr. Harrison Osborne were present? A. That was the same one.

"Q. And you had not made any changes in it? A. With

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no changes. I even took along with me the same double throw switch, prepared to make again a direct comparison with the best Music Master instrument which they might have. And when I saw Mr. Eckhart he took me out into a part of their building where we could make such a demonstration, and they connected their selection of the

Music Master to one side of the double throw switch, and the one that I had brought with me from New York containing the Stentor unit to the other side of the double throw switch.

"Q. And did they then test it out? A. I stood with Mr. Eckhart at the extreme end of the room where we were, and the man who Mr. Eckhart had assigned to conduct this test, which was really their test and not mine, threw over the switches without advising us in advance which was Stentor and which was the original Music Master; and both Mr. Eckhart and myself were about to point out which one was the better, without knowing on my part whether I had picked out the Music Master or

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not, but it was identified as the Stentor, the Music Master horn with the Stentor unit, which produced the best results.

"Q. And what did Mr. Eckhart say to you after this experiment had been performed? A. He said, 'Come along into the office and we will go over the details of what we have in mind.' And then he asked me if I could assure them, in the event that he did place an order, as to the delivery of such orders, asking me if I would make up a production schedule and submit it to them in written form, backed up with some assurance that we could deliver.

"Q. Was there any discussion as to price, Mr. Spence? A. Actually there was no discussion as to price. The price which was then current for loud speaking units or for receiver units——

"Mr. Steel: I do not think this is responsive.

"Q. Was there any mention made in the talk between

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you and Mr. Eckhart on the occasion of this experiment and this conversation about which you are telling us, or

on any other occasion in connection with this transaction, with respect to the price that the Music Master Corporation would be willing to pay for the loud speaker unit, that is to say the receiver unit without the horn or base? A. Yes. As a matter of fact Mr. Eckhart told me what he was paying for the others.

"Q. That is what I want to know. Was that on the occasion of your first visit or on your second, or don't you remember? A. That was on the occasion of my second visit, when he was asking me to make up a production schedule.

"Q. What did Mr. Eckhart tell you that he was paying for his other receiver units? A. $2.10

"Q. Did Mr. Eckhart inquire as to what price you or whoever would make the delivery could deliver the Stentor

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unit at? A. Well, Mr. Eckhart actually agreed in effect that if I would submit the schedule at a price—a quantity price equal to that which he was then paying, that we would get our share of the business.

"Q. You say that Mr. Eckhart agreed in effect. Do you mean that he said so to you? A. Well, the point was brought up by Mr. Eckhart that he would be willing to pay that much—or the then current price; because I had not submitted it on the question of price but on the question of quality.

"Q. Did Mr. Eckhart in this conversation say anything as to the quantity of receiver units for radio loud speakers that he thought the Music Master Corporation might be in the market for? A. Mr. Eckhart told me that he was sorry that I had not come down to see him about a month sooner, at which time he had placed an order for 300,000 units for his Music Master horns, but that they did have

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in mind working up a schedule for the use of an additional 800,000 units—radio units for their horns.

"Q. Over a period of time, I take it? A. Yes, the schedule which they worked out and which he asked me to submit to him later consisted of so many per week of deliveries over quite an extended period of time; but with the assurance that such deliveries could be made.

"Q. You mean with the assurance to Mr. Eckhart? A. Yes, with the assurance to Mr. Eckhart that such deliveries could be made.

"Q. Now did you know at that time, Mr. Spence, whether at a price of $2.10 per unit the Stentor loud speaker unit could be manufactured and delivered to quantity purchasers at a profit? A. I was quite well informed as to the manufacturing cost and knew definitely that at that price they would show a profit of at least 100 per cent.

"Q. There are various methods of expressing profit.

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So as to make it perfectly clear I would rather you would try to express it in dollar terms rather than percentage terms. In other words at a price of $2.10 what would the profit have been per unit in money terms? A. Our cost, or the Klaxon Company's cost, or whoever was manufacturing them, should not have exceeded 90 cents per unit delivered.

"Q. Would that apply to a basis of such quantities as Mr. Eckhart was speaking of? A. In these large quantities that price should have been bettered; but I am playing safe by saying that I knew positively we could produce them in a fairly small quantity for 90 cents each.

"Q. Now in your conversation with Mr. Carroll in February of 1925 did you tell him about your conversation with Mr. Eckhart following the experiment that had been performed for Mr. Eckhart in Philadelphia? A. I told him the details of the experiment and of the request by Mr. Eckhart that we submit a schedule of production with

—711—

deliveries, and the assurance that they could be delivered;

and I then told Mr. Carroll that I had previously come to him just to point out the possibilities of the market, and that this time I had come to him with a definite order practically if they would accept that; and of the request on Mr. Eckhart's part that we work up this schedule; and I wanted to turn it over to the manufacturer of the Stentor unit at that time to go ahead further with the matter.

"Q. Did Mr. Carroll ask you to work up such a schedule? A. Mr. Carroll did not. In fact I could not have worked up such a schedule myself without further help. I had no way of producing such quantities, no source of production."

—736—

"Q. Let us ask you, technically did the diaphragm in the Callophone loud speaker unit operate by motion of the diaphragm as a whole or by flexure of the diaphragm and the body thereof. A. By flexure of the diaphragm."

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—740—

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"Q. And in practice in the manufacture of the Stentor receiver did you fasten the diaphragm tightly between the sections of rubber tubing or only lightly? A. As lightly as possible, just draw it up very carefully with the clamping ring, and they would test it by hand to feel if it could still move; always did that in the assembly."

Now, I turn to page 27, and it will be question by you number 75:

"Q. Now, with respect to the transmitter, Mr. Spence, upon which there was issued the patent which is in evidence, will you state, please, in what respect that trans-

mitter represented departure from prior art? A. In the fact that the diaphragm was free-moving, as we termed it.

"76Q. How did you mount the diaphragm in the Stentor transmitter, Mr. Spence? A. We mounted it between rubber rings, hollow rubber tubing.

—741—

"77Q. Of the same kind that you used in the Stentor receiver? A. Exactly the same.

"78Q. Will you state, please, whether in the Stentor transmitter the diaphragm was mounted so as to be rigidly clamped or fixed at the periphery or so as to be what you call a free-moving diaphragm? A. It was a free-moving diaphragm."

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Mr. Bernays: I shall read briefly, if your Honor please, from the deposition of Alfred P. Sloan, Jr.

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Mr. Bernays: Does your copy, or does the original which you have, indicate the date? Mine does not have the——

Mr. Morris: It is January 20, 1939, ten-thirty o'clock in the forenoon.

Mr. Bernays: Thank you, sir, and there were present of counsel for both sides——

Mr. Morris: The appearances were—oh, counsel for both sides were present, yes.

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"ALFRED P. SLOAN, JR., was called as a witness, having been first duly sworn by the notary public, testified as
—753—
follows:

Direct examination by Mr. Bernays:

"Q. Mr. Sloan, you are president of General Motors Corporation? A. Chairman of the Board of Directors.

"Q. In 1918 were you president of United Motors Corporation? A. Yes.

"Q. Did you become president of United Motors in that year or prior to that year? A. Prior to that year.

"Q. United Motors Corporation was engaged in what business; just give me a description of the company in your own way quite informally? A. They were engaged in what you might call the accessory end of the automobile business; they made parts for motor cars, electrical apparatus, bearings, radiators.

"Q. Was United Motors Corporation a publicly owned company? A. Yes.

"Q. With its stock listed on any securities exchange?
—754—
A. Yes, on the New York Curb Exchange and possibly others.

"Q. The United Motors Corporation owned a number of plants, did it not, either directly or through subsidiaries or through affiliates? A. Yes.

"Q. And distributed in various parts of the United States? A. Yes.

"Q. In May, 1918, the defendant in this case, the Klaxon Company, was one of the affiliates of United Motors Corporation, was it not? A. Yes; not wholly owned.

"Q. That is why I used the expression affiliate. A. Yes."

* * * * * * *

"Q. Did you personally participate in the direction of the policies of the Klaxon Company at that time? A. To

—755—

a very small extent; I cannot remember about that, I can only rely upon the general statement that my participation would be only in matters of prime importance, if any."

And may I have your leave, Judge Morris, to add that the prior question shows that the time referred to in my question was in and around May of 1918?

Mr. Morris: Yes.

Mr. Bernays: Thank you, sir.

"Q. Do you remember for example that in connection with the contract which is in suit in this case you participated actively in the negotiations which resulted in the making of that contract? A. Yes.

"Q. Who participated with you in those negotiations, Mr. Sloan? A. Really I have forgotten.

"Q. Would it call the facts back to your mind if I suggested to you that various of the papers would seem to show that Mr. Durant may have participated in these negotiations? A. Mr. Durant undoubtedly did.

—756—

"Q. And did Mr. Duncan A. McConnell, who was then the president of the Klaxon Company? A. Very likely.

"Q. For the record, will you state which Mr. Durant we are referring? A. Mr. William C. Durant.

"Q. Who was at one time an officer of United Motors Corporation? A. No.

"Q. With what company was he connected? A. He was president of General Motors Corporation.

"Q. Do you remember in those negotiations you also had meetings or correspondence with C. E. Danforth * * *"—that is a typographical error, Judge Morris. That should be Buell Hollister, as it appears from the context.

Mr. Morris: You may read it Buell Hollister——

Mr. Bernays: Thank you, sir.

Mr. Morris: —in place of Danforth.

Mr. Bernays: Thank you, sir.

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"Q. Do you remember in those negotiations you also had meetings or correspondence with Buell Hollister of the brokerage firm of Pyne, Kendall & Hollister? A. Yes.

"Q. And do you remember having had negotiations with Mr. Buell Hollister of that firm? A. Yes."

Mr. Morris: That looks—pardon me—that looks as if that may have been Mr. Danforth instead of Mr. Hollister.

Mr. Bernays: Think so? Well, then, the name of the firm would be wrong.

Mr. Morris: What?

Mr. Bernays: Then the name of the firm would be wrong. It is a typographical error one way or the other.

Mr. Morris: I don't care, you can tell the jury what it is as far as I am concerned.

Mr. Bernays: Then it should be Danforth, is that the way you want it?

Mr. Morris: I don't care.

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Mr. Bernays: Well, Danforth was not in that firm, the testimony shows. It is manifestly a typographical error.

Mr. Morris: All right, I don't care. It is of no importance, anyhow.

By Mr. Bernays:

"Q. And do you remember meeting a Mr. J. L. Spence of the Stentor Company in connection with those negotiations? A. I have no recollection of meeting him.

"Q. Do you mean at that time or at any time? A. At any time."

* * * * * * *

"Q. By whose designation was it that the agreement with the Stentor Company was made with the Klaxon Company rather than any other affiliate or subsidiary of the United Motors? A. I have no recollection of that, but the probabilities are that I did."

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"Q. Now, Mr. Sloan, just to finish the formal portion of the history of this transaction you recollect, do you not, that at December 31, 1918 the General Motors Corporation, of the board of which you are now chairman, became owner of all the assets of United Motors Corporation? A. Yes.

"Q. And as so advised to us this morning by Mr. Smith, your general counsel, the United Motors Corporation was thereupon dissolved in January of 1919? A. That is right.

"Q. And among the assets which were thus acquired by General Motors Corporation at December 31, 1918 was also the stock interest of United Motors Corporation in the Klaxon Company? A. I believe that is the fact.

"Q. Did Klaxon thereupon become a division or department of General Motors? A. I do not recall whether it became a department or division or subsidiary.

"Q. Ultimately at some time General Motors became

—760—

the owner of all the capital stock of the Klaxon Company, did it not? A. Yes.

"Q. Now, I gather from the record, or perhaps somebody here has already testified that at this time in 1919 you became a vice president of General Motors Corporation? A. Yes.

"Q. And did you continue to be the officer of the General Motors Corporation who dealt with the affairs of the Klaxon Company to such extent as the General Motors Corporation did interest itself in its affairs? A. Yes."

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"Q. • • • Do you remember whether at this time in

—761—

1918 United Motors was buying an automobile telephone from Stentor Manufacturing Company for installation in automobiles? A. Yes; and in relation to my previous answer to your question, you asked what did it make; I knew among other things it made telephones of a certain type, but I do not recall all the things."

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"Q. Let me put this general question to you: In spite of the fact that this agreement was entered into twenty years ago or better, is it your testimony that you have no recollection at this time of the type of business that the Stentor Company was engaged in and to be engaged in, if it made a tie-up with the United Motors? A. It is my practice whenever I go into such things to go into them very thoroughly, and following that practice all through my life I have every reason to believe I went into this question very thoroughly. At the time I had sufficient

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knowledge of the fact to justify the contract I recommended. When twenty years passes and all the things I have attended to for twenty years, it becomes a question of recollection and I can only rely on my normal practice; the detail has gone out of my mind."

• • • • • • • •

"Q. But you did participate in the negotiations which finally resulted in a contract? A. The contract I do not think I ever saw.

"Q. Without regard to the details you ultimately did recommend the making of this agreement? A. Yes.

"Q. And the fact is that you recommended it because at that time you thought the making of this agreement would be a desirable piece of business for the United Motors, or such affiliate or subsidiary which made the agreement? A. Absolutely, or I would not have recommended it."

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* * * * * * *

"Q. From the record which I have now shown you, would it agree with your present recollection that the negotiations leading up to the making of the agreement in suit ran over the period of approximately January, 1918 to May, 1918? A. I have no recollection, I would have to depend on the record.

"Q. The records do so indicate to you? A. I see no reason to dispute that.

"Q. During the time when the making of the agreement was under consideration did you at any time visit the plant of Stentor Company? A. I do not recall that I did.

"Q. Have you any recollection one way or the other, or is it simply a blank in your mind? A. It is a blank in my mind.

"Q. Mr. Sloan, are you by profession or training an engineer? A. Yes.

"Q. Have you any familiarity technically with machinery

—764—

details, mechanical devices and that sort of thing? A. I am supposed to have.

"Q. Waiting your modesty, would you be willing to say you do have? A. Yes. Your question covers a very broad field.

"Q. Do you remember that on the takeover of the Stentor Company, Klaxon paid about $130,000? A. I have no recollection.

"Q. Will you take my statement for it for the present that that is a fact, Mr. Sloan? A. I will be very glad to.

"Q. And having that circumstance in mind and having in mind further circumstances to which you have testified, that you ultimately recommended the making of this agreement as a good business transaction for your company, does that bring back to your recollection in connection with the possibility of making this agreement, you ever did visit the Stentor plant? A. I have already answered that question to the extent I have no recollection

—765—

of it. In answer to your further question I regret to say it is a blank in my memory, and I would say that there is no reason why I should have, because in all probability in all transactions I would have provided that it be evaluated by the engineering people.

"Q. Do you remember whether you looked at any devices manufactured or assembled by the Stentor Company before this contract was made? A. I have no recollection.

"Q. In the usual course of your practice in connection with such a transaction, would you have looked into the usefulness and feasibility of the devices you were buying? A. I would have to go into it far enough to justify my judgment that it was desirable, but not to recommend just what processes I would go through. To get that result is entirely dependent on the individual case. Some case I might and some case I might not, it would depend on circumstances to the extent I thought it was necessary and

—766—

desirable, and form the most intelligent opinion. Possibly on this particular transaction I have no recollection.

"Q. Except that you did? A. Except as to the general principles involved.

"Q. In other words, as to the feasibility? A. And to the fact that it was a reasonably good proposition. I

took into consideration the fact that the deal as distinguished from the contract, was predicated as I recall it, on profits rather than a large initial investment.

"Q. You mean on the then going profits of the company, or the future profits you hoped to make out of it? A. That does not enter into it; the contract was based on a profit sharing plan, therefore the importance of the value at that time to the business as a going business was less important than if we had been paying them a large sum of money.

"Q. Of course you did go into the deal in the hope and

—767—

expectation of making profits for your company? A. Otherwise I would not have been justified in recommending it."

• • • • • • •

"Q. Did you in connection with the possibility of going into this Stentor contract, make or direct, or cause to be made any inquiry with respect to profit or apparent profit of the Stentor Company upon its products? A. I do not recall that I did.

"Q. The agreement itself as you have pointed out is an agreement in effect for the sharing of profits? A. Yes.

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"Q. Consequently I assume that the record of profits, if any, of the Stentor Company up to that time, and the possibility of profits in that operation after that time, were matters of prime interest to you? A. I must have gone into it at the time, otherwise I would not have been justified in making the recommendation. The question now is, do I recall; and the answer is, no.

"Q. But you feel certain you must have gone into it? A. Yes, it was part of my responsibility.

"Q. And you satisfied yourself both with respect to profits up to that time, and the possibility of profits which

could have been foreseen in the future? A. Otherwise I would not have recommended it."

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"Q. Mr. Sloan, I take it that the figures furnished to your company by Haskins & Sells are acceptable to you,

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are they not, in respect to their accuracy? A. I don't know of any reason to question their accuracy.

"Q. Your company has always proceeded upon their figures? A. Yes; they are our auditors."

* * * * * * *

"Q. Your company has always proceeded upon their figures? A. Yes; they are our auditors.

"Q. I call your attention to the fact that the advertising expense upon this Stentor operation for the year 1919 as appears from this statement Sloan Exhibit 12 for Identification, according to the Klaxon books, is $2598.06,

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which amount was adjusted up by Haskins & Sells to $3886.57. Are you able to tell me who decided what would be a proper advertising appropriation and expense for this operation? A. The chief executive of the operation, Mr. McConnell.

Q. I think I understood you to say that you went over with counsel the agreement in suit yesterday? A. I only looked at the contract.

"Q. That is what I say, the contract in suit. A. Yes, sir.

"Q. I call attention, Mr. Sloan, to the provision of Article 13 of this agreement which reads as follows, omitting certain language as I go along which is immaterial to my present question:

'The Klaxon Company * * * will use its best ef-

forts to further the manufacture and sale of the articles covered by this agreement.'

Did anybody advise with you as to whether an advertising appropriation of under $4000 for this company was ade-

—772—

quate for the year 1919? A. I have no recollection of that matter at all; it was all under the jurisdiction of Mr. McConnell.

"Q. Now I call your attention to the fact that for the year 1920 according to this same exhibit the advertising appropriation or expenditure for this company was according to the Klaxon records $47.22 and as adjusted up by Haskins & Sells $224.70. Taking the latter figure, that is something under $20 a month, or thereabouts, isn't it? A. That is right.

"Q. Do you consider that that represents any serious effort of advertising on behalf of a product upon which that account has been spent? A. I do not know what the circumstances were which involved that result you speak about. I cannot judge without the circumstances being available, due to the fact that I do not probably know the circumstances. In fact, I have no recollection of it, so I cannot intelligently answer your question.

—773—

"Q. But we can agree on this, that an expenditure of $224 for a year's advertising is a wholly negligible amount? A. It appears ridiculous on the face of it; I don't know the reason for taking that position, and I don't know whether it was chopped or not.

"Q. That means, does it not, that in effect there was no advertising? A. We can agree that that statement is correct, but we cannot agree on the circumstances.

"Q. And I know no more about the circumstances than you do. Directing myself solely to the figures, don't you agree with me that an expenditure of $224.70 a year on

advertising is not for any advertising at all? A. I would agree in the practical sense of the word, yes."

I shall read no further, sir.

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Mr. Morris: No objection.

The Court: Leave granted.

. . . . . .

HENRY GEORGE LEACH, was called as a witness on behalf of the plaintiff, and having been first duly sworn, testified as follows:

Direct examination by Mr. Bernays:

Q. Mr. Leach, what is your business? A. My business is electrical engineering and mechanical engineering.

Q. Would you try to keep your voice up, Mr. Leach— A. Pardon me.

Q. —so that Number 14 there can hear you as readily as I can?

With what company or organization are you connected, Mr. Leach, in that business? A. Electrical Industries Manufacturing Company, Incorporated.

—799—

Q. Which has its place of business at this time where? A. Red Bank, New Jersey.

Q. You have a factory there? A. Yes, sir.

Q. And your office for a place of business? A. Yes, sir.

Q. What is the general character of the business of

Electrical Industries Manufacturing Company? A. Building mechanical and electrical devices under customers' specifications.

Q. Was the office and factory of your business at any time in New York City? A. It was.

Q. That was some years ago? A. Three years ago.

Q. And prior to three years ago how long had your office or place of business been in New York City, Mr. Leach. A. Since 1909.

Q. The same company? A. Same company.

—837—

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By Mr. Bernays:

Q. Now, Mr. Leach, you have been good enough to tell us what could be done. Let me ask you the practical question, have you ever in fact caused the Stentor receiver to be adapted for use as a receiver unit in a radio loudspeaker and made it work? A. We did, and it did.

—838—

Q. The answer is that you did cause it to be adapted and it did work, is that it? A. It did work.

Q. Will you tell us in quite your own way when and how and why? A. Why, it was brought into our plant by Mr. Spence, and two Music Master speakers——

Q. Would you say that what you are referring to is, as nearly as you can determine without taking it to pieces and looking through its insides, what is Plaintiff's Exhibit 73, 73-A and 73-B? A. I would say so.

Q. Go ahead, sir. A. At the time we were making speaker units for Bristol Corporation. Mr. Spence brought in the two Music Master models or speakers and asked if we would adapt one of his units to one of the Music Masters, which was done by one of the workmen. We assembled it and tested it prior to Mr. Spence's hearing it,

and also when Mr. Spence and Mr. Smith and my father were present.

Q. Well, now, will you take that in a little bit more chronological order and detail? You say it was tested

—839—

first before Mr. Spence came to hear it, and then after he—and then when he came to hear it, is that it? A. Yes.

Q. Well, now, I am sorry, let's take the occasion of the first test. Tell us what was done to test the Music Master horn with the Stentor receiver in it.

Mr. Morris: I wonder if I could have when, so I may be able to identify it?

By Mr. Bernays:

Q. Judge Morris would like to know approximately when it was that you so modified a Music Master loudspeaker and tested it with the Stentor receiver in it. A. I think it was around 1922.

Q. Are you clear on that date, or are you in some doubt about it? A. I am a little doubtful.

Q. I am inquiring because another date——

Mr. Morris: No, I would rather he be not given the other date.

By Mr. Bernays:

Q. Well, tell us without regard to what the date is, and I will come back to that in a moment, tell us what

—840—

you did with that test. A. Well, it was a conventional type test of those days, that is, the only means of testing was by ear.

Q. Excuse me, had you finished? I didn't mean to interrupt you? A. The conventional type of testing; you would have a master and try your production model against the master by switching from one to the other after the set signal, we had the input to both of them, and the set signal was adjusted and fed to either one or the other by switching, instantaneously.

Q. Well, now, let me see. Did you have one Music Master horn loud-speaker that was used in this test, or two? A. We had two Music Master horns; one we had disassembled the unit, and the other one we didn't touch.

Q. Well, in the one in which you had disassembled the unit, was that the one in which you had the Stentor unit? A. Yes.

Q. Now, did you test these two instruments in relation to each other? A. Yes.

—841—

Q. How did you do that? A. By switching on the set signal.

Q. Were both of the horns connected to the same radio receiving set or were they connected to different radio receiving sets? A. They were connected to the same amplifier.

Q. Same amplifier.

* * * * * * *

Q. Now, you say you tested it first before Mr. Spence came and heard it, is that right? A. Correct.

Q. On the occasion of that test—on the occasion of that test were you present? A. I generally was present

—842—

at any test work of that type.

Mr. Morris: I didn't hear the answer.

The Witness: I was generally present at any test work of that type.

By Mr. Bernays:

Q. Were you present on this occasion? A. I imagine I was.

Mr. Morris: I move the answer be stricken out.

By Mr. Bernays:

Q. What is your best recollection? You are not allowed to surmise or suppose or imagine in a court room. What is your best recollection? A. My recollection, I would be there.

Q. Now, you have mentioned another test following after that one. A. Yes.

Q. Who was present at that test? A. Mr. Spence and Mr. Smith, and Mr. J. S. Leach, and myself, and the shop foreman.

Q. Mr. J. S. Leach being your late father, sir? A.

Correct.

Q. And on that occasion did you again perform the same kind of test with the same instruments as you have described before? A. Yes.

Q. Will you tell us, please, what is your recollection as to the comparative performance of the two instruments, that is to say, the Music Master loud-speaker with the Stentor receiver unit in it, and the Music Master loud-speaker with whatever unit it had in it? A. The Music Master—in the test between the Music Master and the Stentor unit, the Stentor unit was better than——

Mr. Morris: I am sorry, but I didn't hear the answer. I would like to hear it.

By Mr. Bernays:

Q. Will you start over, please, with that answer. A. In the test between the Music Master loud-speaker unit and the Stentor unit, the Stentor stood up better.

Q. There, again, you were testing the two instruments, respectively, by— A. Ear.

—844—

Q. —mere hearing? A. By ear.
Q. Yes.

The Court: "Stood up" signifies what?
Mr. Bernays: I beg your pardon?
The Court: "Stood up" signifies what?
Mr. Bernays: I would be glad to ask.
The Court: Yes.

By Mr. Bernays:

Q. Would you tell us in a little more detail what is comprised in your expression in one of your recent answers that in that test the speaker with the Stentor unit stood up better? What do you mean by "stood up better"? A. Well, it was slightly better than what the Music Master standard unit was.

Q. In what respects, of performance? A. In volume and also articulation.

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"Q. Are you able to tell us, and if so, will you be good enough to tell us what, to the best of your knowledge, was the cost, the manufacturing cost, of such a receiver unit as I have been inquiring about in quantities during the years 1922 and

—853—

thereafter, including in that cost all the usual items of direct labor, direct material, overhead, and so on?")

Mr. Morris: The receiver unit?

Mr. Bernays: Yes.

Mr. Morris: Very well. I missed the word "receiver".

By Mr. Bernays:

Q. Have you got the question, Mr. Leach? A. I have.

Q. Will you answer it, sir? A. Between ninety-five cents and a dollar and ten.

Q. And during the years 1922 and thereafter, let's limit ourselves to between 1922 and 1929, what would you say was the usual price obtainable, if there was such a price, for these receiver units upon sale to jobbers. A. From a dollar and a half to approximately three.

Q. They have gone as high as three dollars? A. On a single unit.

Q. You mean one receiver unit? A. Correct.

—854—

Q. And your figure of a dollar and a half to three is for one receiver unit? A. It is.

Q. Have you any recollection how high the price went on a single receiver unit back in the years 1922 and 1923, when you said that there was such demand for them? A. In quantities?

Q. Yes, in quantities. A. Three dollars and a half.

Q. It went as high as that? A. Yes.

Q. Do you remember what price you were getting for the complete single receiver unit at any time from the Bristol Company? A. Well, there was two units, one unit was complete with cord and back shell, the other unit was incomplete, without cord or painting or back shell, and they ran two dollars and a half and a dollar and a half.

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Cross examination:

Q. Then what is your conclusion as to that Stentor device now? A. Why, I don't believe I quite understand the question.

Q. How was the Stentor receiver unit that was put into the Music Master horn in the test which was made in 1924, we will say, for the moment, or thereabouts, how was it made? A. How was it made?

Q. Did you assemble it, or was it assembled by Mr. Spence? A. It was assembled by one of our workmen.

Q. You didn't see it assembled? A. I saw it assembled.

Q. You saw it actually assembled? A. It was under my supervision.

Q. No, I don't care whose supervision—are you able to say to me now, Mr. Leach, that you can remember the assembling of a particular Stentor unit fifteen years ago, and that you know that you saw that unit assembled and you can tell me now exactly how that unit was assembled? A. I can tell you now exactly how a unit,

—880—

that unit, was assembled. Whether I saw every piece assembled, no.

Q. Are you able to tell me that you saw the clamping screw in that adjusted? A. No, I wouldn't say that I saw the clamping screw adjusted.

Q. Are you able to tell me now whether or not it contained paper gaskets? A. Not in the receiver shell, never contained a paper gasket, because we never had a die of that size.

Q. Well, let's call it blotting paper gaskets. A. We never had a die for that size case.

Q. All right. A. That would punch——

Q. I am coming right back to it, whether or not you have changed your views within the last few weeks as to how this receiver or this Stentor unit that went into

the base of the Music Master horn was made, adjusted or assembled, and I am using all those words as nearly synonymously as I can. A. Well, it is quite a broad question to answer, because unless I actually saw every

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piece assembled in that unit I couldn't answer that.

Q. Well, now, can you say as a matter of fact that you did see that thing assembled or not? A. I saw it assembled.

Q. You did see it assembled? A. Yes.

Q. And you saw it adjusted? A. I was there when it was adjusted.

Q. No, no, did you make the adjustment tests? A. I—I did this, I heard the finished article. After all, I don't adjust it, because that doesn't happen to be my——

Q. Well, that is what I was trying— A. That isn't my particular job.

Q. No, that was all I was trying to get. So you did not adjust it, and you did not have anything to do with the adjustment of it? A. No, or any other units.

Q. And you don't know, therefore, as to whether the clamping ring was screwed down tightly or was not screwed down tightly? A. No, I would leave that up to

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my trained person.

Q. No, but you personally don't know? A. No.

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Mr. Bernays: This is the deposition of R. M. Critchfield, taken on the part of the plaintiff, at the offices of Delco-Remy Division of General Motors, at Anderson, Indiana, on February 9th and 10th, 1939, at which time, as the minutes show, the witness was sworn, and there were present counsel for both parties.

Direct examination by Mr. Bernays:

"Q. What is your profession, Mr. Critchfield? A. Engineer.

"Q. How long have you been engaged in that profession? A. Well, since I graduated from college in 1916.

"Q. For your information, Mr. Critchfield, let me say

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that without regard to corporate or divisional changes that may have occurred over the years, we have been referring to the operation here at Anderson, Indiana in this plant as the Remy operation, so that whenever I refer to that that is what I mean. You have that? A. Yes.

"Q. How long have you been employed by or connected with Remy as an engineer? A. Since the summer of 1921.

"Q. And since that time you have been continuously so employed? A. That is correct.

"Q. Who was Chief Engineer when you became so employed? A. Mr. C. E. Wilson.

"Q. And then there followed him as Chief Engineer the gentleman who is now general manager? A. Mr. F. C. Kroeger.

"Q. So that you worked from 1921 until December,

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1922 under Mr. C. E. Wilson as Chief Engineer, and thereafter until October, 1925 under Mr. Kroeger as Chief Engineer. Is that right? A. That is right."

* * * * * * *

"Q. Who is Chief Engineer now? A. I am.

"Q. Do you remember that in 1924 you were assigned to become responsible for the engineering and service information on Klaxon horns and Stentor equipment until such time as the engineering work on those products was moved to Anderson? A. I think that is correct; that is,

under the direction of Mr. Kroeger, who was the Chief Engineer."

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"Q. . . . Let us take definitely the period from July 1, 1924 to September 29, 1931. During that period were you at any time the engineer in the Engineering Department of Remy having in your charge or in your responsibility the engineering aspects of the Klaxon and Stentor operations here at Remy? . A. I can answer that by saying that I had the direct assignment of the Klaxon engineering from the time of the transfer until I think, at least, 1931. That is, I was transferred to other duties some time in the 30's, on generator and starting motor work, some time in the 30's, but I think I was on Klaxon all that time. However, there was a period right after the Klaxon work was transferred out here that I was not responsible for the Stentor engineering.

"Q. Was anybody responsible for the Stentor engineering during that period?

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"133Q. Wasn't that also the purpose of following that method of construction in the transmitter itself? A. Well, the invention calls for an inflexible diaphragm, while I don't believe that was ever used, to my knowledge."

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"A. That is correct. The Stentor patent on the transmitter also called for a substantially inflexible diaphragm. In my opinion it would have been virtually impossible to have used an inflexible diaphragm following the Stentor patent teachings and obtained satisfactory results."

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—1036—

PAUL M. FARMER, was called as a witness on behalf of the defendant, and having been first duly sworn, testified as follows:

Direct examination by Mr. Morris:

Q. Mr. Farmer, where do you live? A. Maplewood, New Jersey.

Q. What is your occupation? A. Chief engineer of the American District Telegraph Company and the controlled companies.

Q. What is the American District Telegraph Company? A. It is an organization providing protective services in some two hundred cities throughout the United States. By protective services I mean fire alarm service, sprinkler supervision, night watch supervision, and burglary alarm service.

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Q. About when were you associated with the Klaxon

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Company, Mr. Farmer? A. From February 1st, 1917 until July, 1922.

Q. Little over five years, as I make it? A. Yes.

Q. Let's come down to 1918, or the period with which this suit is concerned, and will you tell me what the Klaxon Company was producing from the first of 1918, on, we will say. A. At the time, at the beginning of 1918, the Klaxon Company was producing a line of automotive signalling devices, also an adaptation of these automotive signalling devices for industrial signalling purposes.

* * * * * * *

Q. Do you remember the plant in Long Island City operated by the Stentor Company? Yes.

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Q. Do you remember the acquisition of the assets, et cetera, of that company by Klaxon Company? A. Yes.

Q. Who continued, who became the manager of that, of the Stentor operations, after the acquisition of the assets by Klaxon? A. Mr. J. L. Spence.

Q. Was he the patentee of the transmitter and receiver patents— A. Yes.

Q. —here in suit? In what capacity did he serve the Klaxon Company after May 20, 1918? A. I don't recall what his exact title was, but he managed the Long Island City plant, and he had to do with the engineering of the product and some of the sales promotion of it. Some of the sales contacts Mr. Spence made.

Q. Was he or was he not in charge of the Stentor plant at Long Island City after the acquisition thereof by Klaxon? A. He was in charge of the plant.

Q. Until what time, Mr. Farmer? A. I am not sure as

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to how long he remained as manager. I don't recall whether in the early stages Mr. Maby, who became production manager, reported to Mr. Spence or to Mr. McConnell, who was president of the Klaxon Company, but I know that Mr. Spence had charge of the engineering and a good number of the sales contacts through the year of 1918.

Q. What enables you to say that after a lapse of twenty years with definiteness? A. I recall having seen a copy of the letter which Mr. Spence wrote to Mr. Maby explaining that the engineering as of that date was to go into my hands. That was the latter part of December.

Q. Latter part of December, 19— A. 1918.

Q. 1918? A. Yes.

Q. You were put in charge of the engineering? A. Yes.

Q. What had been your occupation, your duties with the company, Klaxon Company, prior to that time? A. I first came to the company as a divisional sales manager,

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handling territory through the West, as far as the Pacific Coast territory, and as far east as Pittsburgh, handling contacts with automotive and industrial jobbers on our automotive line and our industrial line.

January 1st, 1918 I was brought to the factory and put in charge there of industrial signalling activities. I remained in this work until it was decided, due to the acquisition of the Stentor Company and another company making other industrial signals, it was then decided to initiate this Industrial Division. This Industrial Division was formed with Mr. Ernst Berg as the manager, and I assisted Mr. Berg in the establishment of an organization, in making market studies and technical studies as to the field, market possibilities, and was later made chief engineer of the Industrial Division.

Q. And you continued as chief engineer until the severance of your connection with Klaxon, am I right on that, in 1922, or— A. No, there was a period at the latter part in which I served, after the division had prac-

—1042—

tically—had moved their activities, I was made a sales agent, in New York City, of the entire line.

Q. Were you a graduate engineer, Mr. Farmer? A. Yes.

Q. Graduate of what institution? A. University of Illinois.

Q. With what degree? A. Bachelor of Science in Electrical Engineering.

Q. Where is the University of Illinois? A. At Champaign and Urbana, Illinois.

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Q. Will you tell us what the experiments by the Klaxon Company consisted of in that field? A. The original experiments were mainly to explore Spence's theory that a substantially inflexible diaphragm resiliently mounted on an air cushion would provide a piston-like action and provide the superior results which he claimed for it. We found in using different weights of diaphragms that as

—1057—

we made the diaphragms stiffer the sound volume which was obtainable from them decreased, even though the mountings were made light. We found——

Q. That is, even though the diaphragm rested lightly— A. Yes.

Q. —upon or between the two rubber tube mountings? A. Yes.

Q. Very good. You may proceed. A. We found, therefore, that in getting the best results we came right back to what is used in the ordinary telephone of that day and of this day, in which the operation is due to flexure of the diaphragm rather than piston-like movement of a substantially inflexible diaphragm.

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—1058—

Q. Now, then, you have told me about the tests that were made to determine whether a heavier or lighter, a stiffer or a more flexible diaphragm, should be used, and you have told me about the test to determine as to whether the rubber gaskets when used were put under pressure, should be put under pressure or not put under pressure. Now, then, can you tell me what particular types of those types, if any, were used other than the one with the brass gaskets that you have told me about, used by Klaxon in 1918, when the Stentor Department

was under the direction of the patentee, Mr. Spence? A. Well, I would say that they were put out in—in two or three ways; one was in which rubber tubing was used for the support on both sides of the gasket I think the Autophones were all put out that way.

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Q. Very good. Now, are you able to recall as to whether before you made these offers to the Navy in 1918 you were using a thick, stiff diaphragm, or whether you were using a thin, flexible diaphragm?

* * * * * * *

A. I do not recall that we ever used what would—I do not recall that we ever used a diaphragm that would come under the characterization used in the Spence patent.

By Mr. Morris:

Q. You mean "substantially inflexible"? A. That is right.

—1060—

Q. That is, if I understand you aright, in none of the devices that were put out by you commercially while you were with Klaxon was a substantially inflexible diaphragm used? A. That is right.

Q. Does that apply to transmitter and receiver as well, or not? A. Yes, it applies to both.

Q. Why did Klaxon turn away from the substantially inflexible diaphragm of the Spence patent to the flexing diaphragm that you have just described? A. In order to get any results at all.

Q. "Any results at all"—you mean any sound, any volume of sound,— A. Yes.

Q. —or you mean any clarity of faithful reproduction, or what? A. Well, primarily to get the volume. You have to get that first, and then worry about the quality of the reproduction later.

Q. Well, do I understand you to say that with the substantially inflexible diaphragm mounted as set forth in

—1061—

the Spence patent, that is, loosely upon rubber tubing, that you were unable to get any volume of sound, any substantial volume of sound? A Yes.

Q. Mr. Farmer, this instrument has been referred to sometimes in the depositions and sometimes by witnesses here as a loud-speaker. When such an instrument produced loud sound—I mean, an instrument of the watch case type, regardless of whether it was thick or thin diaphragm, flexible or inflexible diaphragm, an immobile or immovable mounting, or rigid mounting, or otherwise, but if you got any loud sound out of such an instrument how was such loud sound produced? A. There were two factors. One was putting more energy into the instrument than you would for normal communication, and the other factor would be to provide a projector which would direct the sound volume more effectively.

Q. Well, I expect you have used "projector" in more or less of a technical sense for what I would call a horn,— A. Yes.

—1062—

Q. —or something like that? A. Yes.

Q. When you speak of more energy, putting more energy into the system, I would like you to compare the energy that was put into such a system with the energy that is used in a telephone, for instance. A. It would be possible to take practically any telephone, and by boosting the amount of current in that telephone, get the results that were obtainable with the Spence telephones. It would be possible to take the sort of telephones that are used

for ordinary Bill System communication, or practically any phone, and do that. It is just merely a matter of loading up the apparatus in order to get the amount of energy through it that does provide that additional sound volume.

Q. Now, as I understand you, you do not recall Klaxon ever at any time that you were connected with it having put out an inflexible diaphragm? A. No, we never did.

Q. In operation did you endeavor to find out as to whether there was flexing in the diaphragm during the operation of the devices which Klaxon put out, while you

—1063—

were with that company? A. We made practical tests.

Q. And what did you find? A. We found that there was flexing.

Q. That there was flexing, and that the diaphragm was not substantially inflexible? A. Yes.

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Q. Were the diaphragms in the devices supplied to the Navy substantially inflexible or not? A. They were not.

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Cross examination by Mr. Bernays:

Q. Mr. Farmer, I have on my notes, starting with the latter part of your testimony, first, that you told Judge Morris that in these Klaxon marine telephones there was flexing and the diaphragm was not substantially inflexible. Do you remember that? A. Yes, that is right.

Q. Were you referring to the diaphragm in the receiver or in the transmitter? A. In both—in each.

Q. In each; and I have further on my notes that that

answer was procured from you following a question as to whether you tried to find out if there was flexing in the diaphragm. Do you remember that? A. I do not recall the order of the question. That is——

Q. But you do remember the latter,— A. Yes.

Q. —the question that I have last mentioned, and you said that you did try to find out, or, you made some practical tests, is the way that I have it on my notes? A.

—1066—

Yes.

Q. Is that right? A. That is right.

Q. Well, I wonder if you would be kind enough to help us by explaining to the Court and jury just what your practical tests were. A. I used the word "practical" because they were not quantitative tests. The vibration of a diaphragm in an ordinary telephone is practically a microscopic quantity, which twenty years ago was not easily measured.

Q. Twenty years ago being about the time— A. Yes.

Q. —when you were doing this? A. Yes.

Q. Yes. A. It is on the order of four one hundred thousandths of an inch, is the amplitude of vibration of these diaphragms, so that it was not possible to make a real quantitative test on them.

We did, however, test, make tests, by using successful—

—1067—

or, successively thicker diaphragm, and we found that with the thicker diaphragms and the more resilient mountings that operation was less and less satisfactory.

Q. Well, now, I am afraid I have not made myself quite clear to you, Mr. Farmer. Suppose we get away for a moment from those engineering terms and talk in terms that all of us use daily. A piece of metal flexing means that it bends, is that right? A. That is right.

Q. That is all it means? A. Yes.

Q. Now, I haven't asked you about—in these ques-

tions—about any comparative tests in volume or fidelity of reproduction or anything else. I am asking you about the bending of the metal. Do I make myself clear? A. Yes.

Q. And you have told us, quite correctly, that the vibration or bending—which is it?—in a telephone instrument, the vibration or bending of a diaphragm is practically

—1068—

a microscopic quantity, is that right? A. That is right.

Q. And you have said that you made practical tests of whether these diaphragm flexed or not? A. That is right.

Q. Do you remember that? A. That is right.

Q. And you have also told the Court and jury that you made those tests both as to the transmitter and as to the receiver. Do you remember that? You have to speak up,— A. Yes.

Q. —or the stenographer doesn't get your answer, you see. A. Yes.

Q. Well, now, will you be good enough to tell us, please, just what you did to observe whether in the receiver—let's talk about the receiver first—whether in the receiver, when the receiver was operating, the diaphragm bent or not? A. That would be accomplished by successively using thicker diaphragms. There are only

—1069—

two ways in which sound can come out of the receiver. One is by vibration, due to flexing of the diaphragm. The other is due to vibration due to bodily movement, piston-like action of the diaphragm.

Q. Mr. Farmer, the sound doesn't tell me whether the metal bends or not, does it? A. No.

Mr. Morris: Now, I——

A. (Continued.) But that is why I say there are two things that would make the sound. One is the bending

of the diaphragm. The other is the piston-like action of the diaphragm.

By Mr. Bernays:

Q. Now, what I would like to know is——

Mr. Morris: Now, I think the witness has not completed the detail——

Mr. Bernays: Oh.

Mr. Morris: —of the experiment that he made.

Mr. Bernays: If he has not I will apologize to him, and withdraw——

The Court: Take your time, and conclude the answer.

—1070—

A. (Continued.) As I say, there are two things that would cause speech to come out of that instrument. One would be vibration caused by flexing of the diaphragm, as the diaphragm would flex. The other would be vibration of the diaphragm which would be bodily, a mere translating or piston-like motion.

If, therefore, we gradually increase the size of diaphragms that we use, the thickness, to make it more inflexible, and we endeavor to give a flexible mounting to that, if you can get that mounting flexible enough to get the sound through, then you know you have a piston-like action. If, however, you can with a rigid mounting around the periphery of that, that you know does not permit of the piston-like action, get sound through it, you know that that vibration has come as a result of flexing, and that is exactly what we accomplished.

By Mr. Bernays:

Q. Well, then, as nearly as I can make out—and please correct me if I am mistaken—your test was this, Mr. Farmer. If the instrument worked the diaphragm

—1071—

was flexing or bending. If it did not work it was, the diaphragm was operating on a piston-like motion, is that it? A. No, that is not—that is not the way I stated it. I stated that if it worked under those certain conditions that were true, and I named the conditions.

Q. Yes. A. Which are most essential.

Q. Well, now, I am sorry to say I still haven't got it clear, so if you will bear with me, Mr. Farmer, I want to ask a few more questions about this.

Here is Plaintiff's Exhibit number 86, which is an ordinary Western Electric hand set. A. Yes.

Q. And you will observe I have taken the cap off the receiver unit? A. Yes.

Q. And here is the diaphragm? A. Yes.

Q. Now, when you talk about flexing, what you mean is that this piece of metal, the diaphragm, which I hold

—1072—

in my hand, bends? A. That is right.

Q. And I understood you to say that you made tests which told you whether in operation the instruments that you were—in the instruments that you were observing the diaphragm bent or did not bend. Do you remember that? A. Yes.

Q. And you told us that those were practical tests? A. Yes.

Q. Now, what I would like to know, approaching the thing from the layman's point of view, if you can make it clear to me that way, what I would like to know is what you did to observe or measure whether the corresponding portion in the Stentor receiver units that you were testing, namely, the diaphragm, actually bent in use or not, and whether you determined how much they would, and how you determined that. Just give us a picture, physically, of how you found out in these tests whether the thing was bending or was going this

way (indicating). That is all I want to know. A. Well,
—1073—
I thought I had made that point clear. If this diaphragm rests on this seat, and is held down by this magnet and this operates, we know that that is due to flexing of the diaphragm, because the outer side is held rigid, and the only way in which that can vibrate to produce sound is by flexing.

If, however, we increase the thickness of that to make it substantially inflexible, we found that with the rigid mounting that—that would not vibrate, and would not, therefore, produce sound.

If we go a step further, and endeavor to provide a thick diaphragm and mount on what Spence calls a resilient mounting, we still did not get operation, satisfactory volume, which would have been the condition under the piston-like motion, because there you have an inflexible diaphragm and the only way in which you could get sound out of that would be by bodily translation or piston-like action.

Q. Now, if I am not interrupting you, then in the experiment of the Spence receiver if you got sound out of the receiver, the diaphragm being a substantially
—1074—
inflexible diaphragm and mounted resiliently, did that indicate to you that the diaphragm was moving with a piston-like motion? A. Yes.

Q. And if you got no sound out of it what did that indicate to you? A. Well, it indicated it was just dead.

Q. It was just dead. Now, how did either of those indicate to you whether the diaphragm was bending in the body thereof or not? A. The fact that it was stiff, as would be indicated when you try it without the resilient mounting,——

Q. Oh. A. —would show that the diaphragm was not bending.

Q. Oh, in other words, in other words, you were trying this out with, diaphragms that were so thick that you knew before you tried them that they would not bend? A. Yes.

Q. Oh. Well, then, what was your test about? You

—1075—

knew before you put that diaphragm in the instrument that it would not bend. What was the test about? A. To try and—and bring out the fact—try to establish whether or not piston-like action was a practical feature—

Q. But, Mr.— A. —of the operation.

Q. But, Mr. Farmer, we will come to the piston-like action in the orderly process of the examination. I am not talking about that. I am talking about the flexing or the bending of the diaphragm. Do I make myself clear? A. I thought——

Q. May I have an answer? A. Yes, certainly.

Q. Do I make myself clear? A. Yes.

Q. Yes? A. In that question you do.

Q. Now, you have told us that you tested these diaphragms in operation to see whether they flexed or not. Do you remember that? A. Yes.

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Q. Why, you have even gone so far as to tell us in broad, general answers that in the diaphragms that you were putting into the receivers on these ship sets, those were not substantially inflexible, you remember that? A. Yes.

Q. And you have told us—you were asked, did you try to find out if the diaphragms were flexing? and you said that you made practical tests, you remember that? A. Yes.

Q. And you said that there was flexing and the diaphragm was not substantially inflexible, do you remember that? A. Yes.

Q. In fact, Judge Morris put the question to you in

just that form, and you answered "Yes", do you remember? A. I did not say that the diaphragm was substantially inflexible.

Q. No, it was not substantially inflexible. A. Yes.

—1077—

Q. Perhaps I misspoke myself. Now, it comes down to it that you took a diaphragm that you knew could not bend, is that right? A. That is right.

Q. And used it for the purposes of this experiment, is that right? A. That is right.

Q. So your practical test consisted of taking a diaphragm that would not bend in any event under operating stresses, is that right? A. That is right.

Q. And putting it into an instrument, is that right? A. That is right.

Q. And determining that it did not bend, is that right? A. That is right.

Q. But you knew from the beginning that it would not bend, didn't you? A. No, that was not to determine whether or not it would bend. That was to determine the effect of piston-like action.

—1078—

Q. Well, then, let's come back to the bending. What was your practical test by which you determined whether that diaphragm bent or not? A. That is perfectly simple. It was—it was accomplished by having the periphery of the diaphragm mounted solidly. Now, if that periphery is mounted solidly and the thing talks you know that it flexes.

Q. But if you put a diaphragm there which by predetermination and pre-selection cannot bend, you knew it won't bend, anyway? A. Surely.

Q. That is all your test told you? A. No.

Q. What more did it tell you? A. It told me when you put it on resilient mountings that it did not talk satisfactorily.

Q. Did it tell you anything about whether it bent on the resilient mountings or not? A. No, first, in order to get piston-like action, you have to eliminate bending.

—1079—

Q. Well,— A. That was the reason for that.

. . . . . .

Q. Had you finished? A. That is an answer to my question, I think.

Q. If I get enthusiastic in my questioning you must forgive me. One gets interested in these things. I do not mean to be at all rude to you.

Now, in your tests, then, is this a correct statement? You took a diaphragm which by pre-selection and predetermination would not bend when put into the Stentor mounting, is that right? A. Yes.

Q. And you put it into the receiver unit and you worked the unit to see what the sound results were, is that right? A. That is right.

Q. And that was the test that you talk about? A. That is right.

Q. Now, on what basis did that test enable you to tell Judge Morris and the Court and jury that in these

—1080—

marine telephones that you were supplying the Government there was flexing and the diaphragm was not substantially inflexible? A. Well, that is——

Q. Just tell us how that demonstrated that to you. A. Well, that is a perfectly simple point, I would say, because the diaphragms that we used were of the dimensions that by this test we had proved that they did talk up when they were solidly mounted at the periphery. Therefore, they were talking by virtue of flexing,——

Q. Oh, I see. A. —rather than by virtue of translation.

Q. Now, let's see. Those instruments that you furnished the United States Government, those receiver instruments, were not mounted on the same principle

as the diaphragm in Plaintiff's Exhibit 86, were they? A. No, they were not.

Q. Well,— A. But they would have operated just the same if they were.

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. . . . . .

VLADIMIR KARAPETOFF, was called as a witness on behalf of the defendant, and having been first duly sworn, testified as follows:

Direct examination by Mr. Morris:

Q. Dr. Karapetoff, where were you born? A. I was born in St. Petersburg; now Leningrad, Russia.

Q. When did you come to America? A. At about Christmas time, 1902.

Q. Have you been in America as a citizen of America since that time, from thereabouts, or some time thereafter? A. Since 1909.

Q. Since 1909. What training did you have, what educational courses did you take, Doctor? A. In Russia I graduated from the Imperial Institute of the Ways of Communication, where I specialized partly in electrical

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engineering.

Q. What have been your occupations and professions since you have been in America? A. Since 1904 I have been Professor of Electrical Engineering at Cornell University, and this June, at the expiration of thirty-five years of service, I was retired with the degree of Professor Emeritus.

Q. Doctor, I am going to ask you to lay aside your modesty and give me at some length the facts concern-

ing your professional engineering career. A. In so far as electrical engineering is concerned my first experience with telephone receivers was in 1892, in their use as auxiliary instruments in electrical measurements, and I have used telephone receivers ever since as instruments of measurement.

In 1899 I was sent by the Russian Government further to study electrical engineering to Germany, in preparation for a chair of electrical engineering upon my return. I specialized in electrical engineering in the then famous Polytechnic Institute of Darmstadt, and also worked for a few weeks in the establishments of two well-known

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electrical concerns in Germany.

Upon my return to Russia in 1900 I became an instructor in three Government institutions, teaching electrical engineering a few hours a week each, and at the same time being a junior member in the consulting engineering department of a Government bureau concerned with interior navigation and communications. It was part of my duty to teach students the use of various electrical instruments, including telephone apparatus, and in one of the institutions, the Polytechnic Institute, it was my duty fully to design the buildings and the equipment for their forthcoming large electrical laboratory.

In 1902 I qualified what was then known for adjunct professorship, which corresponds in a way to a doctor's dissertation in this country. In that I had to pass certain examinations, and then in public defend a printed thesis, which was on polyphase electric currents with unbalanced loads. Further to qualify for this professorship I had to give two lectures before the faculty of the institution, one lecture on the subject specified by them,

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and one on a subject of my own choice, and as the latter

subject I chose the speaking arc lamp, which at that time was arousing a great deal of interest in Germany.

The instrument consisted of a carbon microphone into which a person in a separate room spoke, and an arc lamp hanging in the center of the auditorium repeated the speech; that is, the arc lamp acted as a sensitive receiver, whereas an ordinary carbon type transmitter was used. The arrangement was rather curious and spectacular, but not practical, and in order to make the arc lamp work I had to overload the carbon transmitter way beyond its ability to stand, so that we could use it only a few minutes at a time, and I had two transmitters, using them alternately, and as I expected, during the final demonstration my principal carbon transmitter burned out, but I had another one in quickly, switched over to it, and finished the demonstration.

I was sent to this country by the Russian Government further to perfect myself in electrical engineering, previous to being granted a chair at the Polytechnic Institute, and they made an arrangement with the West-

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inghouse Company, in Pittsburgh, for me to become a special apprentice to work a few weeks in each department, so that in the course of two years I could obtain a rounded knowledge of electrical manufacture.

However, upon coming to this country, and hearing of political unrest in Russia, and liking this country very well, I resigned my commission as travelling fellow and remained in this country, applied for my first papers, and when my time came I became an American citizen.

My apprenticeship with the Westinghouse Company was interrupted early in the summer of 1904 at the opening of the International Exposition in St. Louis, Missouri. There was a competition announced among apprentices as to who was to go there to be a part of the personnel in the exhibiting of Westinghouse ap-

paratus. While my knowledge of English was rather deficient, for some reason unknown to me I was chosen with one or two others out of a great many and sent there. The principal—my principal occupation was to speak four languages to the visitors who wanted to

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understand various electrical exhibits, but the interest in the exhibits was only moderate, just because there were many other spectacular things to see, and so I proposed to the management that we install the same speaking electric arc lamp to draw visitors, and they built me a little theater inside one of the exhibit buildings, and the Telephone Company of Pennsylvania, one of Bell's subsidiaries, through their research laboratory, then in Pittsburgh, Pennsylvania, cooperated with me in furnishing telephone apparatus. Of course, the arc lamp itself and the auxiliary rheostats were of the Westinghouse manufacture, so I trained some younger men in using this equipment, but it was my duty to install it, and there again I had to learn the operation of a carbon transmitter for the service in connection with loud-speakers, service that was not natural for that piece of apparatus.

Before the exposition was over I received a telegram asking me if I would not come for a year to Cornell University to equip a new laboratory in electrical engineering, and the Westinghouse officials told me that it would be a favor to them if I would go for the

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year there.

I went there for the year, and for some reason stayed there thirty-five years. One of the reasons, perhaps, why they wanted me was that while at Pittsburgh I gave a course of lectures on alternating currents for the benefit of the apprentices who were my friends and associates there, and that series of articles was printed

in the Electric Journal and was quoted widely until a better series of information became available.

At Cornell University my first duty was to equip the laboratory, which I was doing continuously as the funds permitted, for a few years, at the same time writing a textbook and conducting and guiding experiments. In those years the applications of heavy currents to machinery were not nearly so numerous as they are now, and, consequently, telegraphy and telephony occupied a much greater portion.

If I may make a little digression to indicate the progress in the art, when Benjamin Franklin discovered the connection between electricity and lightning his friends gave him a dinner which they called an electrical dinner,

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on the Schuylkill River, in Philadelphia, and the only two applications that they could think of was to fire a cannon with an electric spark and kill a turkey with another electric spark. I always think of it as showing how many more applications of electricity we have now. But, at any rate, part, a considerable part, of my work was procuring proper telephone apparatus and preparing experiments to acquaint the students with its properties and use.

Those were the days when practically every city in this country had two telephone systems, and, therefore, a number of high grade, independent telephone manufacturing companies were in use. I remember the kindness of Stromberg-Carlson Company, and especially their chief engineer, Mr. Munson, who taught me many things and gave me a great deal of apparatus free of charge. I remember the kindness of Kellogg Electric Company, Holtzer Cabot, and others. We also obtained considerable apparatus that was obsolete from the storerooms of the local telephone companies, and the two principal experiments which I conducted in telephony

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were the adjustment of transmitters and receivers, in addition to simple connections with repeating coils, condensers, and so forth, but the principal thing that I wanted my students to understand was the adjustment and limitations of a carbon transmitter on overloads, and also the limitations and the proper use of telephone transmitters, receivers, their diaphragms and magnets.

In 1911 I was transferred or promoted from laboratory work to advanced theory, and I have been teaching advanced theory to senior students and to graduate students ever since. However, because of the advanced nature of this work my principal two occupations during these twenty-five years were research and consulting work.

My first connections with the industry could hardly be qualified as consulting. It was I who was learning, rather than teaching. In 1905, 1906, I was connected with a company in Cincinnati manufacturing machinery. In 1907 I had a connection with the Niagara Power Company, where part of the work was in connection

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with high voltage lines, but where a troublesome problem was that of telephone lines, because in order to operate a high voltage line you have to have a telephone line paralleling it, and because of the electrostatic and electromagnetic induction from that high power line you had to be very careful how you used a telephone line, careful for the sake of the apparatus itself and the safety of the substation personnel.

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Q. Now, Dr. Karapetoff, I am now going to ask you to go to a device that is similar to the ordinary telephone receivers save in two respects, that you have a

substantially inflexible diaphragm mounted, lightly mounted, on rubber rings or cushions. I am going to suggest to you that the device, that the receiver about which I am asking you so functions that it produces a movement of substantially pure translation in the diaphragm and preserves its parallelism to the plane of silence. I am going to ask you also to assume that the diaphragm of such system is substantially inflexible, and I am going to ask you to tell me how such a system or such a receiver would function. By "function" I mean how it would work, how it would operate, how it would perform whatever work it does. A. The greatest problem of telephone receiver design is a design of this pump or diaphragm which would respond to the frequencies of the human voice within the minimum range

which is sufficient for understanding. A telephone company does not guarantee that all the delicate inflections of human voice would be reproduced, nor does it suggest that you try to transmit music through the ordinary receiver. It tries to construct a telephone receiver through which you can understand ordinary English speech. If the word is unusual or if it is a complicated proper name you usually have to spell it out or repeat it. So that the function of a telephone receiver is to respond properly within a rather limited range, limited in comparison with the requirements of a high fidelity radio or phonograph, and the greatest problem is to design, choose and design the diaphragm and its support, which is an integral part of the diaphragm, in such a way as to make the response to various frequencies sufficiently faithful.

Now, a diaphragm supported in a certain way, in this particular case supported on rubber rings or tubes, has at least one natural frequency, just as the little reeds which were shown here in the court an hour ago. A

diaphragm by itself plus the rubber rings want to oscillate at a certain frequency, and any component or part

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of human speech that happens to have that frequency will be reproduced to tremendous volume; there is no difficulty. So that if, for instance, I wanted to reproduce just, say, bugle calls there would be no trouble in tuning a diaphragm of the receiver to the fundamental frequency of the bugle tone or a few tones, and the response would be great. But how to construct a diaphragm and its support in a way in which it will respond to a range of, well, let's say several octaves, is a different proposition.

Therefore, Judge Morris, before I answer your question more specifically, may I explain briefly what the forced response is as distinct from the natural response about which we just spoke?

Q. You may proceed to do so, Doctor. A. This reed naturally wants to vibrate just at one frequency (indicating).

Q. You are speaking now of the instrument which you exhibited to the jury? A. Yes, sir. This represents the diaphragm with its support to me; now. Naturally, it wants to respond to one frequency, but if voice currents

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of different frequencies reach it, if those currents are strong enough and if the diaphragm with its support is yielding enough, the system can still be made to respond, but its response will be much smaller, and the nature of this response is different, depending on whether that response that is required, the forced response, is below or above its natural frequency.

Telephone engineers have found that the response is much better if your natural frequency of the system is placed quite high, so that you never use that diaphragm in its support at frequencies beyond its natural fre-

quency, or you don't force the diaphragm. Modern, high quality telephone receivers are built this way. But that is not sufficient. This response must be fairly uniform, because if the response is greater, say, at five hundred cycles than it is at a thousand cycles, then the lower tones would be exaggerated, the overtones suppressed, and the sound distorted. You may still understand the speech, but you will be nearer, closer to that condition of distortion where you cease to understand the meaning of the words spoken.

Now, the system that you just described to me, to

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my knowledge, differs from the usual system of telephone diaphragm plus its support in that it must possess a greater weight, because you spoke of its inflexibility.

Q. That is, the diaphragm must possess a greater weight. Very good. A. That is, if I understand you right, that you want it inflexible.

Q. I am speaking of a device where the diaphragm is substantially inflexible, but moves, and preserves, during operation, preserves its parallelism to the plane of silence. A. Well, since the support is more yielding than would be otherwise, and the weight of the diaphragm greater than that of the usual diaphragm, and since the frequency of vibration is direct as the square root of rigidity and inversely as the mass, my answer will be that such a system, consisting of a diaphragm in rubber rings will have its natural frequency much below that of the natural frequency of the usual telephones, and since it is a well-established principle in telephone engineering that a diaphragm does not respond well beyond

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its natural frequency I would say that, without knowing the exact dimension of the system whereof you speak, the response if at all satisfactory will be only for the

low-pitched tones, and it will cut out those higher harmonics which are so essential for good articulation.

Q. Would such an instrument be of any utility in the radio field? A. Again, it depends on the dimensions. Suppose I take a diaphragm of any sort which is satisfactory for radio, and if you can build for me a diaphragm built on the principle that you spoke, and which would have the same natural frequency as a satisfactory radio receiver diaphragm, it would, but I do not see how, with the present size of rubber tubing available, and inflexible magnetic diaphragm, you could construct a device that would have the same natural frequency as that in ordinary telephones.

Q. And without such, would such a device be of any utility in the radio field? A. Not at all.

Q. Doctor, let us pass from the receiver to a trans-

mitter, and I am going to ask you to assume that the transmitter is mounted—I am going to assume that you have a diaphragm sufficiently stiff to be substantially inflexible, mounted on a resilient mounting, such as hollow rubber rings, and which, too, moves, when it moves, in planes parallel to the plane of silence, and ask you whether what you have said with regard to the receiver has any application to such a transmitter, and if not, where the difference lies. A. Broadly speaking, the requirements are the same, because the transmitter diaphragm should be able to move faithfully following the pulses in the human voice, and the receiver diaphragm must create those pulses, so that both diaphragms, if we could see their motion by some miracle, should really be moving almost—perform identical motions.

Q. Well, very good. Now, then, to return to the receiver for the moment, I don't know whether you told me that the receiver described by me, having the dia-

phragm mounting system that I described, would be of low frequency or of high frequency. A. Fundamentally, it has neither high nor a low frequency. Everything

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depends on the size. If you could construct or make special rubber tubes of miniature size, and perhaps develop new material for the diaphragm—I don't know of any materials that are in existence—but, fundamentally, you could build such a system that would be of high frequency, but it is only a theoretical conclusion. We don't know of any materials that would give us a high frequency.

Q. Do you know of any materials that would give you low or even a very low frequency? A. Oh, yes, you take a heavy diaphragm, and ordinary rubber tubing, and you probably can obtain a system of natural frequency of just a few hundred oscillations per second.

Q. Would such an instrument have utility in the radio field? A. Not in the general radio field, unless somebody wanted to transmit, say, just trombone tones and nothing else.

Q. Would it be any good for the transmission of musical sounds? A. If you were just interested in the deep bass.

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Q. I mean of a general range. A. Oh, no, no.

Q. Would it be of any use in the faithful transmission of the range of the human voice in speech. A. I am afraid its natural frequency is too low.

Q. And it wouldn't have the range of voice, the range of vibrations that are created by the human voice in speech? A. No, not nearly. That is, it would cut out the higher harmonics that are so essential for articulation.

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Cross examination by Mr. Bernays:

Q. Dr. Karapetoff, testifying upon this trial is your second contact with the Stentor system, is it not? A. Yes, sir.

Q. Now, the first time is the time which is adverted to in a writing that has been put in here as Defendant's Exhibit 25, I believe.

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Mr. Morris: Mr. Bernays, I wonder if you will pardon me and let me ask just two or three questions on a subject that escaped me at the moment?

Mr. Bernays: Certainly.

Direct examination (continued) by Mr. Morris:

Q. I wanted to ask you about what would be necessary in order to make such an instrument speak loudly. I forgot to ask you that, Doctor. A. Are you speaking about the transmitter or the receiver?

Q. The transmitter. A. The transmitter doesn't speak. The transmitter merely generates greater currents.

Q. Well, let me put it this way, Doctor. I am assuming both a transmitter and a receiver connected, but their design includes a system of diaphragms mounted as we were discussing just a moment ago. Now, then, if the ordinary current is fed to such a transmitter, the ordinary telephone current is fed to such a transmitter, what will be the sound output as compared to the sound output

—1343—

of the ordinary receiver? Is my question clear at all? A. Not quite, Judge Morris.

Q. All right. What I want to get is whether you would have to feed such a system more current in order

to get more sound, or would such a system as we have described make more sound than the ordinary telephone even with the same current? A. I understand that you are speaking now of direct current?

Q. Oh, yes. A. That is fed into the microphone?

Q. That is right. A. Not the alternating currents——

Q. Not the alternating current at all. A. And your question is what effect the magnitude of the direct current has upon the loudness of the speech?

Q. That is right. A. Not articulation; just the loudness?

Q. Just the volume of sound, of loudness. A. Just the volume of sound. Well, a carbon granule microphone is a very complicated piece of apparatus in its function, and

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even at the present time the Bell Telephone laboratory men do not know all the details of its action, but apparently a certain current, direct current, must flow through it to make it respond to vibrations of the diaphragm. Now, suppose I start with the smallest direct current. I will get no response immediately. As I increase this current I finally reach the value of the current at which the loudness in the receiver will be the greatest. But there are two conditions to it; that is, my answer would not be complete unless I qualified it. First, at that level of loudness the articulation may be poor; and, secondly, that current may or may not be within the heating capacity of the transmitter. It may overheat it.

Q. Now, then, I want to get loudness, Doctor, as my output. Would you increase the current, direct current, fed to your transmitter? A. If loudness is all you care for I would raise the current, and see to it that I don't run it too long; turn it off for a while to cool it down.

Q. And large current would have any effect upon the instrument? A. Well,——

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Q. What effect would it have, the large current, in order to get large volume of sound, have upon the carbon

granules? A. An instrument which is normally designed for moderate currents will be overheated, and, moreover, the carbon granules will be put in—partly in a temporary condition of inert state and will be also permanently deteriorated.

Q. What do you call the condition of the carbon granules—question withdrawn.

Q. What does "frying" indicate in respect to a transmitter? A. Frying is noise which you hear in the receiver when the transmitter is not operating under the proper conditions, and in my experience, frying is usually due to an excessive current.

Q. If you had divisional—if you have your carbon granule container divided into sections, and you have one section compact with carbon granules, and fewer—I shouldn't say compact; well filled with carbon granules, while the other sections contain fewer carbon granules

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and are not so full, what would you expect from such a structure? A. It will begin frying at a lower current than it would were the carbon granules distributed uniformly.

Q. So that frying might be attributed to either or both those causes or those things in combination? A. They are in combination, because if they are not distributed properly the current will flow preferably through the section which is filled better.

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Cross examination by Mr. Bernays (Continued):

Q. I was asking you, Doctor, and I think you had been good enough to tell me that this occasion of testifying

upon this trial is the second connection which you have had with the Stentor matter? A. This is true.

Q. The first one bring back in 1919? A. Yes, sir.

Q. At which time you made some comments on the Stentor products and devices to Mr. Farmer, the gentleman who preceded you on the stand on behalf of the defendant in this case? A. I believe my report was to Mr. Berg.

Q. To Mr. Berg? A. I believe so.

Q. That was the gentleman who was the head of the

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Industrial Division— A. Yes.

Q. —of Klaxon at that time. Were you in the employ or on the pay-roll of the Klaxon Company at that time, Doctor? A. Yes, I was.

Q. Do you happen to remember when you entered upon that employment? A. Either before the Armistice, shortly before the Armistice, or shortly after the Armistice, in November, 1918.

Q. And you remained in that employment how long, sir? A. Approximately three years. I believe by that time the Industrial Division was disbanded.

Q. And do you recollect what your compensation per month was during that period of your employment? A. I am not sure, but it must have been——

Mr. Morris: I object. It seems to me wholly irrelevant. If it is pertinent, very good, but it seems to me that going into the compensation is immaterial.

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The Court: Interest arising from payment for service?

Mr. Bernays: Yes, sir.

The Court: That is the idea?

Mr. Bernays: Yes, sir.

The Court: Proceed.

Mr. Bernays: May I have my question read to the Doctor?

(The question was repeated by the reporter as follows: "Q. And do you recollect what your compensation per month was during that period of your employment?")

A. My recollection is that I was paid three hundred dollars a month, expenses and extra compensation for trips out of town. At that time I lived in Ithaca, New York.

By Mr. Bernays:

Q. And were you during those years on the faculty of Cornell University? A Yes, sir.

Q. What is your present business or occupation or pro-

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fession, Doctor? A. Less than a month ago I was retired from Cornell, so that I am just in the beginning of my status as consulting engineer. I am also giving a course of lectures at Stevens Institute.

Q. Do you hold youself out, Doctor, to persons interested in patent litigations as available to be hired as an expert in those litigations? A. I have had considerable experience with patent litigations, mostly in connection with my work for the General Electric Company.

Q. Well, my question was whether at this time you hold yourself out to persons interested in patent litigation as a person who is available to be hired to testify as an expert in such litigations? A. Yes, sir.

Q. And are you the gentleman of the name of Vladimir—is that the correct pronunciation, sir? A. Yes.

Q. Vladimir Karapetoff? A. That is right.

Q. Whose advertisement, for example, I have observed

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in the May, 1939, issue of the Journal of the Patent Office Society? A. That is right.

Q. And is the photostat which I show you the correct reproduction of the outer or cover page of that journal?

(The witness examined the photostat.)

A. I cannot be sure, but it looks like it.

By Mr. Bernays:

Q. As nearly as you can observe— A. As near, yes.

Q. —it is a correct photograph, sir. And is the page that I show you a correct reproduction of the page upon which your advertisement appears, sir?

(The witness examined the photostat.)

A. That is correct.

Mr. Bernays: I offer these two photostats in evidence, Judge Morris.

Mr. Morris: No objection.

The Court: Admitted.

(Received in evidence and marked "Defendant's Exhibit No. 134".)

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Mr. Bernays: The advertisement to which I refer is as follows:

(Mr. Bernays read the advertisement.)

By Mr. Bernays:

Q. I take it, Doctor, that you are being compensated or will be compensated for your services to the defendant in this litigation? A. Yes, sir.

Q. Now, was the occasion of your first contact with the Stentor matter in 1919—withdrawn.

Q. On the occasion of your first contact with the Stentor

matter in 1919, at which time you made some comments to Mr. Berg, was the Klaxon Company manufacturing marine telephones for installation upon naval vessels of the United States? A. At the time when I was sent to Ithaca with particular telephones for testing I was not aware that the Klaxon Company manufactured telephones at all, because my work was on a somewhat different subject.

Q. Well, I am afraid I am not quite clear on what you have in mind, sir. Didn't you at that time, on the occasion of your first contact with the Stentor matter,

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ascertain that the Klaxon Company was manufacturing a receiver and a transmitter which it was designating in its own terminology and to the public as the Stentor receiver and Stentor transmi. er? A No, sir, I didn't know anything about it.

Q. You had an instrument sent to you at Ithaca? A. Yes, sir.

Q. How many instruments? A. Why, probably just two sets, so that I could talk both ways, or it may have been just enough for speaking one way. I don't remember that.

Q. But you do not know what those instruments were, whether they were Stentor instruments or not, sir? A. No, I couldn't tell you what they were.

Q. And it was those instruments that you tested? A. Those instruments that I tested.

Q. And about which you told the Court and the jury this morning? A. Partly those and partly those that I tested later.

Q. Where and when later did you test any instruments? A This spring, in New York City.

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Q. So that, just to make sure that we have it clear, in 1919 there were sent to you some instruments the

identity or manufacture of which you did not know at that time? A. That is right.

Q. And do not know now? A. No.

Q. And in the spring of the current year you made another test upon instruments? A. Yes, sir.

Q. And that exhausts your contacts with those, with the instruments about which you were referring in your testimony of this morning? A. That is right.

Mr. Bernays: No further questions, sir.

Mr. Morris: Thank you, Doctor.

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VLADIMIR KARAPETOFF, recalled.

Re-direct examination by Mr. Morris:

Q. Dr. Karapetoff, after you left the stand you called my attention to the fact that you had some photographs of the instruments which you examined during this last

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month of June— A. I did.

Q. —in New York. I ask you if those are the photographs that you called to my attention.

(Photographs were shown to the witness.)

A. Yes, they are.

Mr. Morris: And I ask that they be marked in evidence. I will offer them in evidence.

Mr. Bernays: I ask Your Honor to look at these

photographs in connection with the objection which I am about to make. I object to the admission of these photographs on the ground that they are incompetent, irrelevant and immaterial; and more particularly that they exhibit nothing except outer structure of casings of instruments with respect to which it is quite impossible from looking at the photographs to identify whether they represent the instruments in suit or anything comparable to the instruments in suit, or any device made at any time which is similar to the instruments in suit. They show nothing as to the inner structure of those instruments. They show nothing as to the conformity or comparative construction between what

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appears in the photograph and what is in suit here, and they are wholly incompetent and irrelevant to any issue on this trial, and the more particularly on top of what I have suggested to Your Honor since they speak, as the witness has himself testified, with respect to something of June of this year, eight years after the agreement in suit had come to an end and after all production under the agreement in suit had terminated, so that there is no proof even to show that these are photographs of instruments constructed as were the instruments in suit or representing any such instruments.

Mr. Morris: I will follow it by showing what was the inside of this instrument.

Mr. Bernays: Well, I submit, sir, that the exhibit which is being offered should first be qualified, if it can be, for admission and proof before it is admitted.

The Court: Well, we will have the entire proof and then make the ruling. Proceed.

Mr. Morris: May I have them marked for iden-

tification so that the Doctor may refer to them by number?

The Court: Let them be marked.

(Received in evidence and marked "Defendant's Exhibit F" and "Defendant's Exhibit G".)

By Mr. Morris:

Q. Do you remember how Defendant's Exhibit F for Identification, how the instrument immediately in front of the girl—what it bore on the casing? Can you see that by magnifying glass? A. Yes, you could see by magnifying glass.

Mr. Bernays: Now, if your Honor please, Judge Morris is now merely having this gentleman testify as to the contents of those documents, not in proof, before those documents have been qualified for the proof, a line of examination with respect to which, if your Honor will remember, objections to questions on my part were sustained only last Friday.

The Court: Do you desire to examine the witness with reference to these photographs?

Mr. Bernays: Well, if the ruling is that the

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witness may testify with respect to what is upon those photographs, yes, sir, but I had understood that the ruling was and would be applied that before what appears on those photographs is put in proof by reciting what appears thereon they must first be qualified for admission, sir.

Mr. Morris: And I am qualifying them for admission by showing what these instruments were because then I shall go on to the inside and show

what was on the inside of the things in the photograph, and what was the objection that was made a while ago, that we had not shown certain things with regard to those instruments of which I hold the photographs in my hand.

The Court: Are the insides visible?

Mr. Morris: No, nor is the inscription or nameplate visible without the use of a magnifying glass.

Mr. Bernays: But no device that you would use, sir, would show the inside of those. It is merely a photograph of the outside.

The Court: The witness is going to testify

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as to the inside. Now, these photographs at most can only be used to illustrate his testimony. That is the extent of their value.

By Mr. Morris:

Q. You have used a magnifying glass on them, Doctor, and will you tell me what is on the instrument at the left— A. May I look at it?

Q. Yes—on Defendant's Exhibit F for Identification.

Mr. Bernays: What is the question that is pending?

(The question was repeated by the Reporter, as follows: "Q. You have used a magnifying glass on them, Doctor, and will you tell me what is on the instrument at the left, on Defendant's Exhibit F for Identification?")

Mr. Bernays: You mean on the outside casing of the instrument?

Mr. Morris: That is right.

Mr. Bernays: Which is the subject of the

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photograph.

Mr. Morris: That is right.

Mr. Bernays: Yes.

A. It says Stentor telephone.

By Mr. Morris:

Q. What is on the middle instrument? A. Klaxon Stenton.

Q. The third instrument from the left—well, you know that without looking at it, without reading it? A. It is a Callophone instrument.

Q. Callophone set. Thank you, Doctor.

Wait a minute, let's look at the other, Exhibit G for Identification. Can you tell which is which without a magnifying glass, Doctor? A. I would rather look.

Q. Very good.

(The witness examined Defendant's Exhibit G for Identification.)

A. Referring to the middle set, Callophone to the left, Klaxon in the middle, Stentor to the right.

By Mr. Morris:

Q. Very good. All right, you may go back to the

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stand if you please, Dr. Karapetoff. Did you examine the receiver and transmitter of the Stentor structure in Defendant's Exhibit F?

The Court: Now, let's see, what are we getting into? Whose product is this?

Mr. Morris: This is the Stentor product, so far as we know, the Stentor Company.

The Court: The only suggestion as to that is something stamped on the——

Mr. Morris: It is in the casing, the same as here (indicating).

Mr. Bernays: Shall I help you, sir? I had supposed, if your Honor—I hope I am not interrupting or interfering.

The Court: Well, yes, you are.

Mr. Bernays: Then I shall stop, sir.

Mr. Morris: The only evidence, as far as I know, by which the Plaintiff's Exhibit 75 was produced was that it was produced as a device which was obtained by, I think, Mr. Spence or learned counsel from some shop—am I right on that?—and that——

Mr. Bernays: That is right.

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Mr. Morris: —it was produced as a Klaxon device. That is conceded.

The Court: That is admitted.

Mr. Morris: It doesn't matter whose device this was, so far as its functioning is concerned, if it operated, if the structure was the structure of the patent. The question is not who put it out so much as how it was constructed and how it functioned. For instance, if the Stentor Company had put out a device that was not made in conformity with the patents that would be one thing, but it wouldn't have established how a thing made in conformity with the patents would function. Now, then, if this device was made a certain way, or if this device was tested in accordance with the patent, that would show that this witness did test a device that was made in accordance with this instrument. Now, then, whether that instrument was made by Stentor or made by Richard Roe or John

Doe it would make no difference. It might be even made by this witness.

The Court: You are going to show, or this

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is offered for the purpose of showing that the patented device is something not practical?

Mr. Morris: Oh, yes, I am offering this to show that there was no piston function, that the devices that were compressed vibrated segmentally and flexed and all that, and that even then they were good only for bugle calls, etc.

The Court: Now what is the objection to this picture?

Mr. Bernays: I object in the first place, sir, on the ground that photographs of the devices are not the best evidence of the devices themselves, nor the devices are not accounted for.

I object, sir, on the next ground that before the photograph of the device or a device itself can be qualified for any such purpose there must be competent proof of the age of the instrument, its condition, its being constructed in conformity to the method and manner of design with which it was constructed at the times in suit, of the same material; in other words, to show that what Dr. Karapetoff tested, with respect to which he is being quali-

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fied to testify as to a result, was an instrument such as the instrument which is in suit here, and as to that there is no proof whatever, sir.

Mr. Morris: The casing, the casing on the outside, except as it bears inherent evidence of the source of this device, is more or less immaterial, as we have none of us discussed this casing of Exhibit 75, but we have discussed exhibits——

The Court: Judge, may I ask, did the Doctor testify that he examined the instruments that are pictured by him in the photograph?

By Mr. Morris:

Q. You did examine the "innards" of these devices shown in these photographs? A. Yes, sir, we assembled them after tests, and tested again.

By the Court:

Q. And who took the photographs? A. The official photographer of the laboratories where the tests were performed.

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Q. Was that in Cornell? A. Electrical Testing Laboratories, New York City.

The Court: Now, he has testified to what he examined, the physical object, has he?

Mr. Morris: No, he said that he made the examinations in June, and a question was put questioning whether he had made an examination of a device constructed in conformity with the Stentor patent, whatever that is. Then afterwards the Doctor called my attention to these photographs which he had, and then I went into the matter some little bit with him.

The Court: Well, the witness has testified that he did disassemble these objects that are there pictured?

Mr. Morris: That is right.

The Court: And this is a picture of the objects that he did disassemble?

Mr. Morris: That is right.

The Court: And that those objects embody what is known as the Spence patents; is that his testimony?

Mr. Morris: He hasn't said that.

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Mr. Bernays: No.

Mr. Morris: He is going to say what those things were. As a matter of fact, he will show what was in the receiver and the transmitter, he will show that the rubber in there had been compressed, as I understand him, and that the rubber that was in there was old and aged, that they had tested that functionally in the condition in which they obtained it, they then disassembled it, put in new, live rubber, of the kind we put in evidence here the other day, and tested it again, with whatever results they got. He will have to tell you his own results.

The Court: Well, we have had all the testimony that is to be offered, have we, in regard to the objects there pictured?

Mr. Morris: No, here is a transmitter on this device, and somewhere I assume there is a receiver, on one or the other, and what I am asking him now is to tell us how those were constructed when he got them, whether he tested them in the condition in which they were, whether he disassembled them

—1368—

and can tell us the condition in which he found them, whether he put them together again with new rubber and mounted them loosely and then tested them, and the conditions that he found.

The Court: Well, very good. Go ahead with that testimony——

Mr. Morris: That is correct.

The Court: —and then offer your pictures.

Mr. Morris: Yes, sir, that is what I was doing. I think my last question is of that character.

Will you read the last question?

(The question was repeated by the Reporter, as follows:

"Q. Did you examine the receiver and transmitter of the Stentor structure in Defendant's Exhibit F?")

A. I examined them after having performed tests on them as they were received.

By Mr. Morris:

Q. Will you go ahead, Doctor, please, and tell me what those tests were, what they showed?

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The Court: One moment. Are you objecting?

Mr. Bernays: May I inquire—I am not sure as to the question, sir, so I cannot state—is this as to the tests that were made before disassembling and reassembling?

Mr. Morris: Yes.

Mr. Bernays: Then I object to the question, sir, on the ground that upon the face of it it is manifest that whatever they used must have been something of a great many years of age. Judge Morris has himself stated in his argument to Your Honor to qualify this proof that the rubber in the unit was dead at the time when it was tested, and it is manifestly not a test of comparable instruments. They have taken an old instrument of some kind, which is not yet clearly identified, but which by admission was in a deteriorated condition when it was tested——

The Court: It is the nature of rubber to deteriorate. It is of the nature of rubber to deteriorate.

Mr. Bernays: Yes, sir.

—1370—

The Court: Not necessarily of the diaphragm to rot.

Of what use is this old stuff that you are putting in? I don't quite get it.

Mr. Morris: To show that the patented device was no good.

Mr. Bernays: There is no proof—excuse me, sir.

Mr. Morris: That is the purpose.

The Court: There is a fan back here that more or less distorted my hearing.

Mr. Morris: To show that the patented device was no good, would not function other than as the Doctor testified this morning, or this afternoon.

The Court: When was this thing put on the market?

Mr. Morris: This particular device, or the Stentor device? If you mean the one in the photograph, we don't know.

Mr. Bernays: Oh, I think I can throw some light on that, sir, from the record. The witness

—1371—

Farmer testified that they completed delivery of their marine telephones, the last marine telephones, within not exceeding a year after the last order that they got from the United States Government.

The Court: Well, that means what?

Mr. Bernays: That means that they did not manufacture any of these instruments subsequently to November of 1919, sir, so that there could not have been any instrument of this kind of which

Judge Morris is speaking, or as to which Judge Morris performed tests, that was less than twenty years old.

Mr. Morris: I think that is correct.

Mr. Bernays: Of course, it is.

The Court: Well, of what use is that testimony?

Mr. Morris: Now, you are speaking of the test of the instrument before, in the condition in which it was received?

The Court: If it be an instrument twenty years old, I think it doesn't——

Mr. Morris: Very good.

—1372—

The Court: Expert testimony as to its character I think would be irrelevant to anything in this case.

Mr. Morris: There is only one possible exception to that, it seems to me, and that would be as to whether or not—what was the amount of pressure upon the rubber in that device. I am not greatly concerned about it. I am more particularly concerned with what happened when they took it down, reassembled it with new rubber, and then subjected it to the tests, so I will withdraw the previous question as to what the tests showed prior to their reassembling it and their testing it.

In other words, Dr. Karapetoff this morning testified that he had examined these instruments, and then he told the results. Now, what I am getting him to tell is the details with regard to that experiment, and I am going to ask him as to whether he built this up, put it under light compression, loosely mounted, or whether it was compressed, etc., etc., etc., and then let him tell what the experiment was. It doesn't matter who built the instrument,

—1373—

provided he reassembled it using a diaphragm, rigid, inflexible, diaphragm, if he did, and a loose rubber mounting. Now, he will have to tell you what he produced.

The Court: Well, if the reassembly involved re-manufacture we are getting a new instrument.

Mr. Bernays: Yes.

Mr. Morris: Suppose we assume it is a new instrument, but is assembled in conformity with the terms of the patent. Then it would——

The Court: Assume the doctor would say it is; what is the instrument that you obtain?

Mr. Morris: I cannot answer that. I shall ask him as to whether it was a telephone receiver and a telephone transmitter that had a substantially inflexible diaphragm, and whether or not he tested it for vibrations, for piston-like movement, and so on. It may take some little time to go into it.

The Court: Well, I am inclined to consider that this evidence may go in subject to all the cross examination to which it may be subjected. It is

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now twelve minutes of five o'clock, seventeen minutes past adjournment. The Court will reserve a ruling on this question until tomorrow.

Will you be able to return, Doctor?

The Witness: Yes, sir.

Mr. Morris: I am sorry, I had intended only to offer the photographs.

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—1376—

LEO A. KELLEY, was called as a witness on behalf of the defendant, and having been first duly sworn, testified as follows:

Direct examination by Mr. Morris:

Q. Mr. Kelley, where do you reside? A. Jackson Heights, New York.

Q. What is your occupation? A. I am a consulting engineer, specializing in radio and communication engineering.

Q. Where did you get your training for your profession? A. I graduated from the Massachusetts Institute of Technology in 1918, receiving a degree of Bachelor of Science in Electrical Engineering, and also from Harvard University, a similar degree in Electrical Engineering. My course of studies included the usual mathematical studies, the courses in applied mechanics, which would include, for example, the problems of deflections in beams and structures of that sort, and my professional training, as an undergraduate, consisted of specialization in

—1377—

that branch of electrical engineering which has to do with communications, that is, telephones, telegraph, both cable and land, and radio, and I paid particular— or, rather, I had particular training in the high frequency or radio field.

Among other things, I studied the various instruments that are used in this field, for example, the telephone receiver. I repeated some of the experiments which Dr. Kennelley had previously performed, I believe something like 1910 or 1911, on the motional impedance of a telephone receiver. I was trained also in the laws of vibratory circuits, of course, with particular emphasis on the electrical circuits. The analogous mechanically vibrating circuits are treated in exactly the same mathe-

matical way, and conclusions are of an exactly similar nature.

After graduating I joined the Signal Corps of the United States Army, and was at Camp Vale, in New Jersey, and also at Yale University. My work had mainly to do with the radio end of the Signal Corps work.

In 1920 I joined the engineering staff of the Western

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Electric Company, at 463 West Street, New York City. This company is now operating under a changed name, that of the Bell Telephone Laboratories. I remained in this position from 1920 until 1925. I was engaged in research and development in connection with communication systems employing the high frequencies which were known as carrier, sometimes called wired radio. That included both telephone and telegraph transmission circuits and equipment.

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From 1925 to 1929 I was an engineer in the department of development and research of the American Telephone and Telegraph Company, and I continued my work in connection with the telephone and telegraph apparatus, particularly, again, the high frequency type.

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From 1929 to 1932 I was employed as an engineer by the International Telephone and Telegraph Company, in the particular company, International Communications Laboratories, and during that time I developed a new type of carrier telegraph system which was to be employed in the place of a telephone circuit. That did not employ the high frequency, but was more directed to occupy a circuit which would otherwise be useful to transmit the voice frequencies.

From 1932 to date I have been engaged in consulting engineering, with particular emphasis, as I said at the beginning, on radio and communication problems. I have published a number of engineering articles in technical publications. I delivered two lectures at the Massachusetts Institute of Technology, I think somewhere—it is either 1932 or 1931, on an original method, theory and method of design of electric wave filters. These electric wave filters are in the electrical sense a rather complex

—1381—

system, vibratory system, and it is in arranging to make use of the vibratory laws of Nature, so that they will produce some useful result, that electric wave filters are designed.

I have been a member of the American Institute of Electrical Engineers for, I think, about eighteen years, and the Institute of Radio Engineers for about eleven or twelve years, and recently I joined the Radio Club of America.

I believe that brings me up to date, sir.

Q. Mr. Kelley, have you examined patent to Spence number 1,112,392, which issued September 29, 1914? A. Yes, sir.

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Q. What do you understand, Mr. Kelley, by the statement ". . . transmission of sounds in their original purity, free from distortions or modifications", et cetera, as stated in that paragraph.

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Mr. Bernays: Before interposing or deciding not to interpose an objection, sir, may I inquire what

is the purpose of the testimony? Is the validity
—1383—
of the patent being sought to be put in question?

Mr. Morris: The plaintiff himself has in evidence the invalidity of the patents as Exhibit 96. The testimony of Mr. Kelley will go to point out either that the patents are invalid or, in any event, that the theory of the patentee, as set forth in his patent, is a pure theory, that it does not disclose means whereby that theory can be carried out, any more than the man who conceives the theory of perpetual motion has been able to devise means for carrying it into effect, and that even if the theory were sound, even if the theory of the patentee were sound, and devices could be had, means could be had whereby that theory could be put into practice, that would be a sluggish system, would be confined and restricted to an apparatus of low frequency, and would not be, therefore, useful in the broader fields.

Mr. Bernays: Now, if Your Honor please, taking up my learned friend's description of pur-
—1384—
poses seriatim, I object to any testimony whatever looking to questioning the validity of this or any of the other patents in suit, on the ground that such testimony is irrelevant, incompetent and immaterial by reason of the perfectly established rule that a licensee is estopped in law to question the validity of the patent under which he holds and operates the license.

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The Court: Well, assuming the soundness of that proposition, pass to the next.

Mr. Bernays: Very good, sir. As to the question of whether in devices being manufactured or

sold by this defendant, the disclosures or teachings or principles of our patents were being used, again, the law steps in and makes such proof entirely irrelevant and immaterial, on a perfectly simple, equitable ground. Now, on that score we have prepared for Your Honor a prayer to instruct, appended to which is a citation of some of the cases, and I call Your Honor's attention, if I may be permitted to go into that question of the admissibil-

—1385—

ity of that proof to that extent, to the cases which we cite there, including, if I remember correctly, a well-known case which was decided by our learned friend when he was on the bench.

The first of the cases, and the one which contains the rule in a sentence, is Andrews against Landers, in 72 Federal, at page 666, where a licensor brought suit against a licensee to recover royalties under a license agreement. The Court said as to the rule of law:

"As to the so-called 'Andrews Faucets,' I hold, as a matter of law, that defendant, having stamped said faucets with the Andrews patent, and having accounted and paid for the same, is estopped to deny that they do not contain the patented improvement of Andrews."

The case decided by my learned friend when he graced the bench in this District is *Barber Asphalt Paving Co. against the Headley Good Roads Company,* in 283 Federal at 236, where the same ques-

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tion was involved, and Judge Morris wrote:

"The defendant lastly contends that the emulsion manufactured by it is not the emulsion covered by the patent. It is, however, the same emulsion that has been manufactured and sold by the defendant

at all times under the license and on which royalty has been paid. Furthermore, by the license agreement, the defendant expressly covenanted to promote the use and sale of the bituminous emulsion of the patent. It may be that the defendant is thereby estopped from denying that the emulsion here in question is not covered by the patent."—citing the Andrews versus Landers case from which I have already read, and other authority—"But it is not necessary to base the decision of this matter upon the doctrine of estoppel", said Judge Morris, "for a licensee is liable, not only when he uses the identical article covered by the patent, but also when he uses an article equivalent thereto."

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The Court: Well, see how far I follow you, Judge. If this were a suit for royalty you are an exclusive licensee——

Mr. Morris: I will assume so.

The Court: —and as such, you cannot question the validity of the patents—as such.

Mr. Morris: On that assumption I cannot. Waterman v. Mackenzie tells me that we are not a licensee, but we are in fact the assignee. Your Honor has dealt with that.

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Mr. Morris: We will leave to Your Honor the question as to whether this was a licensee or an assignee.

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The Court: Judge, I wonder if by stating the state of my mind we might not be approaching some mutual ground on which we could prolong this contest?

Mr. Morris: As you will. It seems to me that Your Honor may be called upon to make a direct ruling as to whether this is an assignment or a license, and, as I say, personally I am not concerned which it is. Nevertheless——

The Court: Well, I have considered it, and I consider it a license——

Mr. Morris: Very well, then at some time——

The Court: —in view of the payment of royalties, and in view of the conduct of the parties under it, as a definitive construction, I regard it as a license, among other reasons.

Mr. Morris: Very good. Now, I am perfectly willing to consider that a ruling in the case, although that issue is not now presented by this question, but I understand it. If Mr. Bernays is willing that that be considered as a ruling in this

—1390—

case all I will do is ask for an exception under it and proceed on the theory that this is a license.

The Court: Well, if it is an appropriate time to make the ruling, the exception is entered.

Mr. Morris: Well, is it agreeable to counsel for plaintiff to consider that a ruling for all purposes of this case?

Mr. Bernays: Oh, certainly. That is the ruling——

Mr. Morris: Very good.

Mr. Bernays: —that I have been urging, sir.

The Court: Now, the next point, Judge Morris, is the product of this licensee that was marked

"Patented", that it sold to its associates or the outside world. You are contending that that stuff was not within the patent?

Mr. Morris: That stuff is not here in issue. The thing——

The Court: I would be inclined as at present advised to consider you as estopped from questioning that that matter, so marked——

—1391—

Mr. Morris: And so sold.

The Court: —was not within the patent.

Mr. Morris: I think there is no difference, I think I am in accord with the view that you say, with respect to that, the material that was actually sold——

The Court: Yes.

Mr. Morris: —and actually delivered.

The Court: And actually marked "Patented".

Mr. Morris: And actually marked "Patented". If in a suit for division of the profits with respect to those actual articles, I would think that Klaxon, having marked those, even though it was not within the patent, might have been precluded with respect to those specific articles from taking that position. But those articles are not here in issue. We are dealing now with the use of best efforts to do what? To make something under this patent—not the things which we are estopped from asserting, because there is no estoppel running here. Indeed, that which I just read is the

—1392—

evidence of plaintiff, which says that the things that we were manufacturing were not under the patent or not under the patents. That is, he says: "Possibly Mr. Spence may at some time have made a telephone receiver embodying this invention, but

no one having anything to do with the manufacturing business seems to have any knowledge of any such apparatus." That is their testimony. It is not mine.

The Court: No, with the unmanufactured stuff about which they are complaining——

Mr. Morris: Yes.

The Court: —undoubtedly you can show that had it been within the patent it would have been worthless.

Mr. Morris: Well, the difference in those boundaries I think won't make any practical difference, so if I may—I think that is not a ruling, however, unless your Honor desires me to consider it as such.

Mr. Bernays: I request that——

The Court: The last utterances of the Court——

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Mr. Bernays: I request that ruling, sir, and on the record acquiesce in it. If the defendant can show the state of facts that your Honor has suggested in your observation I should concur with your Honor that that would be admissible. That is not within the other two fields. And I am perfectly willing to abide by that ruling.

Mr. Morris: I don't know exactly where we are.

The Court: Well, this has just been discussion.

Mr. Morris: Yes.

The Court: I am not pretending to rule anything.

Mr. Morris: The position which I will take is not adverse to the last statement by your Honor. In order that we may have the whole thought clear, it will be my position that as to stuff which we have not manufactured and did not manufac-

ture, if the stuff—I don't know how to say it. Let me try it again.

The Court: Well, that is all right—had it

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been within the patent, would have been valueless.

Mr. Morris: Yes, but I want to go further—had it been within the patent would have been valueless, and that we are not estopped from showing that nothing that was ever made was within the patent.

The Court: Yes, although marked "Patented".

Mr. Morris: If marked "Patented".

The Court: You are technically estopped——

Mr. Morris: As to that which was marked.

The Court: Exactly.

Mr. Morris: I agree with that, but my mental confusion—it is not a practical one, but the mental confusion is that if my friend, the learned counsel, should assert that we should have continued to make that which we did make, but which as a matter of law and fact was not within the patent, we say that we were under no obligations to do that.

The Court: Or if within the patents was valueless.

—1395—

Mr. Morris: That is right.

The Court: That is all right.

Mr. Morris: I do not see that there is any—may we have the question, please?

The Court: But the stuff manufactured and marked "Patented" technically you are estopped from questioning.

Mr. Morris: Yes, but that stuff is not in this case, as I see it. I mean, that was all paid for. The thing we are talking about here is not what we actually did manufacture, but they say we

should have gone on manufacturing stuff which was, as we contend, outside the patent, and then if we had gone on manufacturing stuff that was outside the patent, and had gone on paying them, dividing the profits with them, they would have made something, if we had made more than fifteen per cent at it.

Well, that is the case, so perhaps we can get to those issues a little later.

The Court: Very good.

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Q. Mr. Kelley, let's stop there. He says that he is aware that air cushions have been used in certain classes of acoustic instruments for the purpose of firmly clamping the edges of the diaphragm intended to act by flexure. Well, then, did you understand that firm clamping is disclaimed by him, or claimed by him as a part of his invention? A. I think he very definitely disclaims it, along with the use of air cushions for mounting the diaphragm, providing they are tightly clamped.

Q. Well, then, his patent, if any, or his invention, if any there was, lies where? A. It lies in a thick diaphragm between air cushions which are not tightly clamped.

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Q. Now, then, Mr. Kelley, I told you a while back that I was going to ask you the effect upon such a system of

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thickening the diaphragm and having it mounted as set forth in this patent. What is the effect as to whether

it is a sluggish system or a faithfully reproducing system? A. A heavy diaphragm mounted in accordance with the teachings of this patent would constitute a very sluggish system, diaphragm system. It would have a very pronounced natural period at a very low frequency. It would be wholly incapable of reproducing speech that could be understood.

Q. Would such a system, such a heavy diaphragm mounted on such rubber tubings, have any practical commercial value? A. It would have no practical commercial value for the purpose of voice transmission. It might be used for the purpose of transmitting other sounds.

Q. For example? A. Well, bugles have been mentioned, or code calling, and that sort of thing.

Q. Well, how would it be for ordinary telephone conversation, and how would it do, how suitable or unsuitable would it be for radio? A. It would be wholly un-

—1399—

suited for either ordinary telephone use or for radio reception.

Q. Now, how do you account for the use, how do you account for the installation of the so-called Spence device or Stentor device in the Autophones?

Mr. Bernays: Now, I object to that question, sir, on the ground that Judge Morris is manifestly going into the field which as I understand this morning's ruling is not open to this defendant, namely, the question of whether what they manufactured they claim to have been manufactured in accordance with the patents or not.

The Court: The objection is overruled.

The Witness: May I have the question repeated?

(The question was repeated by the Reporter, as follows:

"Q. Now, how do you account for the use, how do you account for the installation of the so-called Spence device or Stentor device in the Autophones?")

The Court: Is it not for this jury to know

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whether or no this device used in a limousine car was rendered by a changed and flexing diaphragm instrument, not within the patent?

Mr. Morris: It seems so to us.

The Court: Now, undoubtedly, when they stamped it "Patented" they are estopped so far as that device is concerned from questioning that it was a patented thing, but, as I have stated, I think the jury are entitled to know that it was talkable because it flexed.

Mr. Bernays: If that is your Honor's view I shall not differ from it in the least, because I want the jury to know what your Honor thinks they should know, but in that event may I have this gentleman, who as nearly as I can make out was about seventeen or eighteen in those years, tell the jury how he does know?

By Mr. Morris:

Q. You may do both. As a matter of fact, you did not make any personal experiments on the device, did you? A. On the Stentor device?

—1401—

Q. Yes. A. No.

Q. Your answer is based upon your scientific knowledge as an expert, is it? A. Yes, sir, on what could and could not work.

Mr. Bernays: Then in that case, sir, I object that this gentleman is certainly not qualified to testify as to what was in any particular installation. He is simply guessing as to what would have to be put into that installation, but he can't give us any testimony as to what was in it.

The Court: What is the question?

Mr. Morris: He can give us opinion evidence that such a device if made in conformity with the patent would not enunciate clearly, it would not repeat, it would not be a regular performance, a uniform performance, and that if it was really intelligible, it had to work by flexing and not by piston motion.

Mr. Bernays: I will take that as the witness's answer.

—1402—

The Court: The testimony of a witness,—an expert witness is necessarily an opinion witness,—

Mr. Bernays: Yes.

The Court: —and if this gentleman be qualified to give an expert opinion he can answer this question.

Mr. Bernays: Yes. Well, I am willing to take that as the witness's answer, what Judge Morris has just stated.

By Mr. Morris:

Q. Did you follow me? Was that correct? Will you have Mr. Rodebaugh read it to you and see whether I was accurate or not? A. Yes, please. I would like to have it.

Q. Because it is your opinion that I am asking for.

(The statement was repeated by the Reporter, as follows:

"Mr. Morris: He can give us opinion evidence

that such a device if made in conformity with the patent would not enunciate clearly, it would not

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repeat, it would not be a regular performance, a uniform performance, and that if it was really intelligible, it had to work by flexing and not by piston motion.")

By Mr. Morris:

Q. Will you give me your answer with respect to the question, Mr. Kelley? A. I agree substantially with the statement there, and I will repeat it just for the sake of accuracy in my own words.

Q. Fine. A. That is, the instrument referred to must have operated on the principle of flexure of the diaphragm because—and, therefore, not according to the principles described in this patent to Spence—because, according to the teachings in the Spence patent, the device would have been constructed with a heavy, massive diaphragm, which would have been incapable of transmitting intelligible speech.

Q. And if we assume intelligible speech from the lady on the back seat of the limousine to her chauffeur, then you must assume what? A. I must assume that the

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instrument was capable of reproducing not only the high frequencies, or high tones of the voice—or, rather, not only the low tones of the voice, but also the high.

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Q. Let me assume a transmitter and a receiver mounted as Spence says in his patents, transmitter patent and receiver patent, and I will ask you whether there is

anything in either of those things, transmitter or receiver, as revealed or disclosed by Spence, which makes the Spence system a louder-speaking system than the usual system. A. There is nothing revealed that would indicate that the Spence system were any louder than an ordinary system.

Q. Does he show any means or instrumentalities whereby it would be a louder speaking system than, for instance, the Bell Telephone receiver of the same size? A. No, sir.

Q. Then if Spence gets a loud sound or volume of sound from his device, tell me, please, sir, as one skilled in the art how it must have been obtained. A. It must have been obtained by using excessively large currents through the transmitter and applying those currents to

—1406—

the receiver, overloading in both instances, first, the transmitter, and, second, the receiver.

Q. What is the effect of overloading, Mr. Kelley? A. The effect of overloading, even in an otherwise perfect or practically perfect system of telephonic communication, even in that case, overloading would cause serious distortion.

Q. And you mean by distortion what, a different output from the input? A. I mean that instead of getting clearness, naturalness, good articulation, and all the other things by which we describe good telephonic transmission, we would get the opposite; in other words, we would get poor articulation, poor quality and inferior output, something that was much less like the thing that was put in.

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Q. I asked you a while ago as to whether the Spence

system or the Stentor system, speaking of the receiver, had any practical or commercial utility. I will ask you whether the Spence system, speaking of the transmitter as well as of the receiver, has any practical or commercial utility. A. The answer to that question is, no.

Q. Has the Spence system any practical utility in the field of radio? A. No, sir.

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Q. May I break in on you? Just one question we might forget when you finish: do you remember when the amplifying tubes came in and were used in telephonic systems? That is, do you know that from the history of the art. A. Yes, sir, I know definitely from the history of the art that they came into extensive use in—in the telephone circuits of the Bell system, prior to 1915.

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TWELFTH DAY

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By Mr. Bernays:
By Mr. Steel:

Q. I am not certain that there is one pending, but this is the question I have in mind, whether any of the patents which I have handed you reveal whether or not Spence was the first person who conceived of a diaphragm

—1411—

having a piston-like motion. A. Well, the answer to that is "no", and I find in the S. G. Brown patent, number 1,096,676, which is Defendant's Exhibit 53, in the specification of that patent upon page 1, beginning at line 100, it reads as follows:

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. . . . . .

> "The diaphragm is so arranged as to be free to move as a whole, that is to say all points on its surface vibrate equally, and to insure this action the periphery of the diaphragm is either quite free or is attached to the usual casing by a mere thin ring of flexible material."

Where he says that the diaphragm is arranged to be free to move as a whole, he means, generally speaking, just exactly what Spence meant when he said the diaphragm should have movements of translation only.

Q. Is that the only point of similarity, general similarity, which you find between the Spence patent and the Brown patent, which is Defendant's Exhibit 53, which

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you have just referred to? A. That is the only similarity, and it involves merely—the similarity involves merely the very general idea of piston motion in a diaphragm for the purpose of sound reproduction.

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These are the differences which I have pointed out between the Brown and the Spence patents.

Q. I wonder, so that the Court and jury may have the points of differentiation in summarized form, whether you cannot just in a sentence or two review what you have told us, so that the high points of distinction may be uppermost in the minds of the Court and jury. A. Well, point number one, Brown's diaphragm is not acted upon by the magnet. In Spence, it is.

Point number two, Brown's diaphragm is not flat. That enables it to attain rigidity without—by means of shaping it, whereas the diaphragm in the Spence patent is flat.

Another point, the diaphragm in the Brown patent is made as light as possible, whereas in the Spence patent

—1415—

it is made heavier by thickening the diaphragm for the purpose of making it flexible.

A third point of difference—or, rather, a fourth one, the diaphragm of Brown is mounted so as to be free from restraint by this thin tissue or other similar material being attached to the edge and not holding it back when it is made to move, whereas in the Spence device—that is, the device of the Spence patent—the diaphragm is placed between the rubber tubular mountings which he refers to as air cushions.

And, finally, in Brown there is an attached spring. In the Spence patent, Spence disclaims the use of springs in that he says, in effect, that that is one of the causes of all the trouble that he hopes to overcome.

Q. With respect to those points of distinction which you have just alluded to, Mr. Kelley, can you tell us whether or not those differences are of importance in the satisfactory functioning of a receiver, or whether they are merely inconsequential variations of detail and construction? A. They are decidedly important in all

—1416—

sound reproducing devices, and I lay particular emphasis on the fact that Brown has disclosed in his patent a very

light diaphragm, the diaphragm is very light in weight, and this is indispensable in obtaining sound reproduction which will give intelligible and good quality reproduction.

And, also, an important feature is the separation of the diaphragm from the dual job of driving itself and also producing the vibrations in the air, that is, creating the sound waves in the air. This is extremely important, and it is a feature that is used in all practical loud-speakers, and it arises—and the advantage arises from this. The diaphragm in a receiver of the Spence type, since it has to drive itself, has to have some thickness, anyway, in order to allow the flux, the magnetic flux, to pass through it and to allow the magnet to produce a substantial pull on it. The necessity for some thickness there is contrary to lightness of the diaphragm, which is essential for the diaphragm doing its other job, namely, acting on the air and sending out the sound waves.

Also, this separation enables you to select a light

—1417—

material as opposed to being tied down to the use of heavy material, as iron. It enables you to get away from the flat shape, in other words, it enables you to achieve a light-weight diaphragm, which is absolutely essential as a good, practical loud-speaker.

And the attached springs, the attached springs in the device of Brown, either the attached springs in the device of Brown, or clamping, is present in all practical loud-speakers.

Q. Mr. Kelley, confining yourself now to what I might generally refer to as an ordinary telephone receiver, that is, a receiver which is not performing any loud speaking function, is it desirable for the diaphragm in such receiver to have a natural period of vibration? A. Yes, and that natural period of vibration in a telephone receiver, as I have explained, must be at or near the upper end of the frequency range. That is, it must be so de-

signed that it will have a tendency to respond more easily to the upper pitches or higher pitches of frequency of the tones. That is absolutely an essential to

—1418—

the telephone receiver, and when that is done with the telephone receiver you get reproduction of all of the tones below that, down to the lowest tone the receiver is capable of reproducing.

Q. Is the same true with respect to a receiver which is used for loud speaking purposes? A. Well, a loud-speaker does not utilize the natural period of vibration at the upper end of the frequency range, but at or near the lower end of the frequency range. The reason for this is, in the case of the telephone receiver the instrument is intended to be held near the ear. It is, therefore, called upon to work referring to one law, one physical law.

In the case of the loud speaker the sound is intended to be projected out into the room, radiated and let loose from the instrument, and that operates according to another law, the natural law of vibration, as I said, for a loud-speaker, working according to the law that is required on account of projection of the sound into the room. That loud-speaker diaphragm, nevertheless, has to be able to vibrate readily and reproduce the sounds all the way up the highest notes that it is desired to

—1419—

reproduce, which is achieved only through the use of the lightest possible diaphragm.

Q. You say achieved only by the use of the lightest possible diaphragm. Is that indispensable to the performance of the function which you have just described? A. Yes, that is what I meant by my answer.

Q. Is it possible to construct such a diaphragm by following the teachings of Spence's receiver patent? A. No, as I have already pointed out, in order to follow

out the teachings of the Spence patent you would arrive at a heavy diaphragm, which is impossible to use with a loud-speaker or a telephone receiver for the reproduction of intelligible speech.

—1420—

Q. Mr. Kelley, can you in a few words review for the Court and the jury those particular features of the Spence receiver patent which in your opinion, as a man skilled in the communications art render that receiver unsuitable or unsatisfactory for practical usage? A. Yes, sir. In the first place, the diaphragm is acted upon directly by the magnet. It is so shown in figure 1. In the Spence patent specification on page 1, line 35, it states that the diaphragm is so mounted as to yield to the magnetic impulses.

Again, on page 1, at line 85, it is stated that the improved receiver comprises a diaphragm mounting, cushions and magnet, and nothing more.

At page 1, line——

Q. What is the particular significance of the expression which you have used, "and nothing more"? A. Well, I mean to say that the magnet and the diaphragm are the only things that would act together in that description

—1421—

in that combination, and, therefore, the diaphragm must be of magnetic material, and is acted upon directly by the magnet. There is nothing else present to form an intermediate agency.

Q. Such as the reed— A. Such as the reed.

Q. —in the Brown receiver or patent? A. In the Brown patent, or a rod connected with some other driving device, and so on.

At page 1, lines 54 to 57, the figures, that is, figure 1

and 2 of the patent, are described, and it is stated there that the magnet is arranged so that it won't put any sudden pull on the diaphragm which would cause flexure of it. In other words, it is simply a statement, again, that the diaphragm is acted upon directly by the magnet.

Another point is that the diaphragm is flat. It is shown so in the figure, that is, in figure 1, particularly.

In the specification, at page 1, line 80, it states that the diaphragm preserves its parallelism to the plane of silence, the plane of silence being the plane formed by the

—1422—

diaphragm when it is not reproducing speech, and a plane describes only a flat surface.

The next point is the diaphragm heavy. This is owing, in the first place, to the fact that it has to be of iron because the magnet acts upon it directly.

At page 1, line 37, is a statement, such diaphragms are substantially inflexible under the stresses to which they are normally exposed, "such diaphragms" being flat diaphragms, and making them substantially inflexible by the only way you can make a flat one inflexible, or substantially so, by thickening, and the thickening, of course, makes the diaphragm heavier.

At page 1, lines 88 and 89, there is the only instruction given in the specification explicitly as to how the diaphragm should be proportioned, and it says here that the diaphragm thickness should be proportioned. That is the only way in which he states how to do anything about making the diaphragm of that type that he wants, namely,

—1423—

rigid. The diaphragm must be substantially thicker because the magnet acts, pulls on it, substantially at the center.

You probably recall the demonstration with the two pencils and the ruler, and also common experience that when you walk out on the middle of a plank that is sup-

ported at either end you get the biggest sagging or bending effect when you are in the middle. That diaphragm acting substantially in the center is shown in figure 1, and in the specification at page 1, lines 50 to 54, where it says that the two pole pieces—that is where the pull emanates from the magnet—are presented symmetrically on both sides of the center of the diaphragm.

Also, it must be substantially even thicker because the mounting is such that the edges of the diaphragm are free to move, to tip. There, again, I call attention to the demonstration in which first we had the ruler across the two pencils and pressed on the center of it, and it gave very readily, because the ends were allowed to tip; and then in the second instance the ends were substantially clamped, that it, held fixed, just as a plank would be

nailed down at either end, and that immediately made the ruler substantially stiffer, that is, it would bend only a little bit as compared with the other case.

Well, the fact that, with the edges being allowed to tip up, bending more easily, simply adds on top of the other thing, that is, the magnet acting in the center, and the necessity for even greater thickness, and, consequently, even greater weight to the diaphragm.

Another thing with this type of mounting, where the edges of the diaphragm are allowed to tip, it is easy to see that the entire diaphragm, the entire weight of the diaphragm, would take part in motion, whereas when the diaphragm is clamped around the edges it is easy to see that around the edges it certainly won't move, because there it is clamped, and near the edges it will have only a small motion, so that when the edges of a diaphragm are clamped only a fraction of the weight of the diaphragm actually enters into the movement, whereas with the edges free to tip the entire weight of the diaphragm enters into the movement. I point that out because it is an added,

—1425—

effectively added weight to the diaphragm in use. All practical loud-speakers are made, as I have already explained, with their diaphragms as light as they can be made. Some of them are made even out of paper. Some of them are made out of aluminum and alloys of aluminum —duralumin, in particular—of such thinness that in some cases they are not more than about two thousandths of an inch thick.

The diaphragm of the Spence patent is mounted between what he calls air cushions formed of rubber tubes which yield readily. In a device of that type, of which his patent purports to be an improvement, it is physically impossible, in the first place, to have anything hold the diaphragm back which yields readily, because it has to hold it against the pull of the magnet; but assuming that such a thing were physically possible, then in the telephone receiver this readily yielding cushion, this mounting that has practically no force that it can give to the diaphragm is not in a position to move the diaphragm in the direction away from the magnet, and you recall that I explained that in this type of instrument the magnet

—1426—

can only pull on the diaphragm, it cannot push, it depends upon the spring action in the diaphragm, or the diaphragm in its mounting, in order to recede or go away from the magnet. Well, such an arrangement, of course, with readily yielding air cushions, would be sluggish and would not reproduce the higher voice frequencies or tones.

So that when we consider the teachings of this patent as a whole it is impossible to build either a telephone receiver or a loud-speaker which will reproduce intelligible speech, and I am referring also to the use of this instrument as a makeshift loud-speaker, that is, with a horn attached, and using as much current as the coils of the mag-

net can stand. Even under those conditions it will not be able to reproduce intelligible speech.

Q. Mr. Kelley, during your qualifications, as I recall it, you told us that you had been employed by several manufacturing concerns who were in the business of manufacturing telephonic devices and equipment prior to the time when you began your consulting engineering ac-

—1427—

tivities? A. Yes, that is, with the engineering department of the Western Electric Company, and the engineering department of the American Telephone and Telegraph Company.

Q. Mr. Kelley, may I ask you this question as a person skilled in the communications art, whether you have ever personally observed, or have ever been told by anyone of any manufacturing concern which utilized the teachings of the Spence patent in the construction of their receivers? And in answering my question I do not desire to confine myself specially to the time prior to the time when the Spence patent expired, but propose to have my question include the time from September 29, 1931 until the present day, September 29, 1931 being the time when Spence's patent, receiver patent, did expire. A. I know of no such instrument, either telephone receiver or loudspeaker, which was constructed in accordance with the teachings of the Spence patent.

Q. By any manufacturing concern? A. By any manufacturing concern; any source of information that has been available to me.

—1428—

Q. And does your response include the period from September 29, 1931, when Spence's patent expired, down to the present time? A. Yes.

* * * * * * *

—1429—

Cross examination:

* * * * * * *

Q. Well, then, surely you are not citing the Brown patent against Spence on the grounds that you stated to me a moment ago, on this cross examination, that the Brown patent preceded Spence and covered the same ground that Spence was covering? A. I didn't say that it covered the same ground. I said it limited the scope and it showed, as I explained in my direct testimony, a diaphragm system which has a very large number of features which are of great practical value in practical loud-speakers.

—1430—

Q. Now, Mr. Kelley, I call your attention to the fact that upon the uncontradicted proof in this case the Spence receiver patent was issued under date of September 29, 1914, that the agreement in suit was made May 20, 1918, that over the period of the agreement in suit there was sold by the Klaxon Company an aggregate of just under a million dollars of product, all of which the Klaxon Company stamped as being under the Spence patent, advertised to the extent that it did advertise as being under the Spence patent, that that million dollars of product went all over the United States, to various purchasers, and that during all that time there was never any claim made, suit instituted or proceeding started claiming that the Spence patent was preceded by other or prior art, or that the Spence product infringed other or prior art. Having in mind those circumstances which I call to your attention because, apparently, you have not been present on the trial continuously, having in mind those circumstances, does that affect your judgment as to the validity of any of the testimony that you have been giving us? A. Not whatever.

—1431—

Q. It makes no difference to you? A. No, sir.

Q. Now, Mr. Farmer—Mr. Kelley, I am sorry, sir. A. Yes.

Q. I was thinking of Mr. Farmer for another reason, as you will see in a moment.

Mr. Kelley, I am looking at Plaintiff's Exhibit number 105, which is a copy of a letter dated September 28, 1918, from the Industrial Division, Klaxon Company, by Mr. P. M. Farmer, who preceded you on the stand, in which Mr. Farmer, speaking of the marine telephone, the Klaxon-Stentor instrument, says the following:

> "Our instruments may be adjusted to keep the current within the limit which you specify and at the same time give excellent clearness and sound volume."

Does the fact that Mr. Farmer so stated to the Navy Department affect your judgment or any of the opinions which you have expressed in your testimony? A. No,

—1432—

sir.

Q. Now, Mr. Farmer, you will remember, had to do with the selling of these devices beginning very shortly after the agreement was made? A. I don't know as I can keep all the details straight.

Q. Well, then,— A. Whatever they were, the record will show.

Q. Yes. Well, let me call the circumstances back to your mind as I recall them from the testimony. Mr. Farmer was in the Industrial Division with a Mr. Berg in 1918, from the time that agreement in suit was made, in May of that year, until about December of that year? A. Yes.

Q. And then he went over into the engineering work, so that it would be reasonable to assume, would it not, that Mr. Farmer had a practical familiarity with this device and its workings achieved from the contact with it that I have described? A. I didn't know Mr. Farmer at the time. I know nothing about his capabilities at that time.

—1433—

Q. You would not be willing to make that assumption with me? A. Well, if you want to make it as an assumption, very well.

Q. Would you rather I assume that the Klaxon Company put an incompetent in charge of the work, Mr. Kelley?

The Court: Oh!

Mr. Bernays: I will withdraw that question, sir.

By Mr. Bernays:

Q. Proceeding upon that assumption, Mr. Kelley, you would nevertheless stand upon the opinions and the judgment that you have expressed, as against the opinion and the judgment expressed in this letter? A. Yes.

Q. Prior to the coming in of the cone type of loudspeaker, Mr. Kelley, how many millions of radio loudspeakers, using a flat diaphragm, acted upon directly by the magnetic system, would you say were manufactured and sold in the United States? A. I have no figures on that, and I cannot tell you.

—1434—

Q. It ran into millions between 1922 and, let's say, 1927, did it not? A. I wouldn't—as a general statement I can't—I can't classify those different types of loudspeakers as to the number sold. I have no information on that, and, therefore, I am unable to answer questions of that sort.

Q. Well, it is a fact, is it not, that between the years that I have mentioned, taking that period from 1922 to 1927, the radio loud-speakers in the United States were loud-speakers which used a telephonic receiver with a flat diaphragm? A. No, sir.

Q. Would you say that the great majority of them were? A. This is only an estimate, and based on such information as I have already told you is in my opinion not very good, as to the number, but I recall very distinctly that the diaphragms that were used even on the very earliest loud-speakers were not flat, but were—and were not acted upon directly by the magnet, they were

—1435—

acted upon by a separate driving device which was called the balanced armature type of drive, the diaphragm itself being not magnetic, and the diaphragm not being flat, but corrugated, in rings, concentric with the center, for stiffness.

Q. And if Mr. Critchfield, the chief engineer of Remy, testified to the contrary, as this record shows, you would disagree with Mr. Critchfield? A. Yes, I would.

* * * * * * *

—1436—

By Mr. Bernays:

Q. Mr. Kelley, I want to call your attention to some testimony given by Mr. R. M. Critchfield, who, as the record shows, was the chief engineer at Remy at the time that we examined him, and had had a spell, from about 1926 to 1931, in charge of the Stentor operation at Remy. A. I will have to assume that, as I do not recall the details.

Q. Well, will you assume with me that the record does show that? A. Well, if it does I will assume it.

Q. Yes. Now, I call your attention to the following

testimony given by Mr. Critchfield, and will you follow me as I read it:

"Q. As a matter of engineering, it would be a simple matter enough, would it not——

Mr. Steel: What page are you reading from, Mr. Bernays?

Mr. Bernays: I am sorry; page 175. I am beginning with question number 639, Mr. Steel.

I will start over again, Mr. Kelley, when Mr.

—1437—

Steel is ready.

By Mr. Bernays:

Q. "Q. As a matter of engineering, it would be a simple matter enough, would it not, to clamp down the diaphragm in a receiver so that the diaphragm was so fastened at the periphery as to be substantially immovable? A. Yes.

"Q. Did you try to achieve that result here at Remy when you were manufacturing the Stentor Autophone? A. No.

"Q. Did you try to achieve the result when you were manufacturing the Stentor Autophone here at Remy of having the diaphragm so set in the receiver that the diaphragm as an entirety would have mobility? A. No.

"Q. What was the purpose——"

The witness interposing:

"A. • • • Maybe that is not just right. I guess the answer there should be, 'yes'.

—1438—

"Q. Now, taking the Stentor Autophone receiver

as a whole, is it not the fact that in its fundamental principles and construction it was of the type of mechanism which * * * at the times in question— A. "which was * * *."

Q. "* * * which was at the times in question being used as the receiver on the ordinary commercial telephone? A. Except for the use of the rubber air cushion, and except for the question as to whether or not a permanent magnet was used, yes.

"Q. The ordinary commercial telephone did have a permanent magnet, did it not? A. The ones that I was familiar with did have.

"Q. But in the ordinary commercial telephone the diaphragm was fixed at the periphery so as to be made as nearly as possible immovable, was it not? A. I like the term used awhile ago, 'substantially immovable'.

"Q. I will be glad to use the term. That states

—1439—

exactly what I have in mind. And that was the exact point of difference in that respect between the ordinary commercial telephone receiver and the Stentor receiver, was it not? A. That is correct.

"Q. Now, I think you told us yesterday, Mr. Critchfield, with respect to the transmitter that if you succeeded in getting in the transmitter what I shall refer to in brief terms as a movable diaphragm, you would get less distortion of the voice and better production of the voice than would be the case with a transmitter in which a fixed diaphragm was used. Do I correctly recollect your testimony of yesterday in that respect? A. That is on the basis of all other things being equal?

"Q. Yes, of course. A. Yes.

"Q. Would that also be true as to the receiver portion of a telephonic mechanism? A. Yes, with the same reservation, all other things being equal."

—1440—

Do you agree with that testimony of Mr. Critchfield, or do you not? A. You read——

The Court: Would you return the testimony to the witness?

Mr. Bernays: Oh, certainly, if Mr. Kelley wants it.

The Witness: I should like to examine it at length, and also call your attention to the fact that reference is made to other testimony of which I know nothing.

By Mr. Bernays:

Q. Well, the reference to other testimony is stated right in the body of what I have read you, is it not? Look at question 647. Doesn't that state the other testimony?

The Court: Whose question are we dealing with, the original question?

Mr. Bernays: No, I was directing myself to Mr. Kelley's last observation that there was a reference in the body of this testimony to other

—1441—

testimony, and I am calling his attention to the fact that where there is a reference to other testimony——

The Court: You are withdrawing the original question, are you?

Mr. Bernays: For the moment, sir.

The Court: Very good:

Mr. Bernays: For the moment.

The Witness: Very good. Now, will you indicate to me just which questions and answers you read, so I can now study them——

Mr. Bernays: Yes.

The Witness: —at my leisure, because there are quite a few things covered here——

Mr. Bernays: Yes.

The Witness: —and there is—and I can see no general answer which can be given, at least, offhand.

By Mr. Bernays:

Q. The portion that I have read you, Mr. Kelley, begins with 639, at the place where I have bracketed it in red —1442— crayon, as appears on this page, and it goes over to the answer to question 649, where, again, I have bracketed the answer, showing the end of the quotation. Do I make myself clear? A. Yes, sir.

Q. That is the question—that is the testimony of Mr. Critchfield as to which I am putting a question to you: do you or do you not agree with it? A. And if you will be kind enough to let me review this again to myself I will try and give you as clear an answer as I can.

The Court: Do you want to recess while the witness has an opportunity?

Mr. Bernays: I don't know how long Mr. Kelley will be. May I ask Mr. Kelley how long he thinks he will be?

The Witness: Well, I really don't know myself, because I found questions in here in which the thing referred to was not clearly enough or specifically enough described so I can give the—

so that I can give an intelligent consideration to the answer.

—1443—

Mr. Bernays: Well, as to the question which I am now putting to you, namely, how long you think it will take you, I have to be guided by what you say, Mr. Kelley. I don't know.

The Witness: Well, let's say two or three minutes.

Mr. Bernays: I don't think we need any recess for that, sir.

The Court: Very good.

Mr. Steel: May it please the Court, I don't want to unduly interfere with Mr. Bernays' course of cross examination, but it does seem to me that there is one particular portion of Mr. Critchfield's testimony which possibly the witness should be asked about. I don't want to make any reference to it, but would like to call Mr. Bernays' attention to it and suggest to him the propriety of asking. Of course, whether or not he does is entirely up to him.

Mr. Bernays: May I suggest, sir, that that would be proper material for such re-direct as Mr. Steel——

The Court: Very good.

—1444—

Mr. Bernays: —desires to go through?

(The witness examined the transcript of Mr. Critchfield's testimony.)

The Witness: I wonder if you would like to have me take this up question by question, because I find a considerable diversity in the type of question and answer. For instance, some of them ask more or less questions involving opin-

ions, others as to what he did. Those are quite different in character.

Mr. Bernays: I will be happy if you take it up in your own way and make your answer in your own way, having in mind that the objective of my question is to ascertain whether you agree in respect of that testimony with the chief engineer who from 1926 to 1931 had charge of this Stentor operation at the Remy plant, or disagree with it.

The Court: It is part of the business of the Court to protect the winess, and if you are covering quite a field in this question probably he should be accorded the privilege of dealing with each element in the answer of Mr. Critchfield.

—1445—

Mr. Bernays: That was exactly what I had in mind, sir.

The Court: Very good.

Mr. Bernays: But I wanted him to do it in his own way, sir.

The Court: Very good.

A. (Continued.) Yes; therefore, I will take them up a question at a time. I don't see any other way of doing it intelligently.

The first one was question number 639. I agree with Mr. Critchfield's answer to 639.

By Mr. Bernays:

Q. May I suggest that when you merely refer— A. Well, I will read it.

Q. —to the number of the question it doesn't mean much to the jury. A. Do you want me to read the question?

Q. Or tell them the substance; you do whichever you

wish to do. A. Well, perhaps the more accurate way would be to read the question. Question 639 is:

—1446—

"Q. As a matter of engineering, it would be a simple matter enough, would it not, to clamp down the diaphragm in a receiver so that the diaphragm was so fastened at the periphery as to be substantially immovable?", the answer to which question was: "A. Yes."

I agree to that.

Question 640:

"Q. Did you try to achieve that result here at Remy when you were manufacturing the Stentor Autophone?"

The answer is, "No", and I have no knowledge of it. Therefore, I have no way of agreeing or disagreeing.

The next question, 641, is:

"Q. Did you try to achieve the result when you were manufacturing the Stentor Autophone here at Remy of having the diaphragm so set in the receiver that the diaphragm as an entirety would have mobility?"

The answer is, "No". Again, I have no knowledge.

—1447—

That was something, "Did he do it?", and I don't know.

Question 642:

"Q. What was the purpose——"

Answer—the question was interrupted—the answer was:

"A. * * * Maybe that is not just right. I guess the answer there should be, 'yes'."

And the same thing I had to say about the previous question holds good there, too.

643:

> "Q. Now, taking the Stentor Autophone receiver as a whole, is it not the fact that in its fundamental principles and construction it was of the type of mechanism which was at the times in question being used as the receiver on the ordinary commercial telephone? Except for the use of the rubber air cushion, and except for the question as to whether or not a permanent magnet was * * *"—

oh, I am sorry, I was reading the answer as part of the question. The answer begins:

—1448—

> "A. Except for the use of the rubber air cushion, and expect"—I think it is a misprint for "except"; except "for the question as to whether or not a permanent magnet was used, yes."

That is not my answer. Now, I should like to have you show me a Stentor Autophone receiver.

Q. I am afraid I cannot, Mr. Kelley, I am sorry. I should be happy to show you one if I had it. A. Well, I never—I never saw one which to my knowledge was ever proved to be one, and it implies a knowledge of the Stentor Autophone receiver in answering this question.

Q. Well, then, would your answer be that you are unable to state whether you agree or do not agree with Mr. Critchfield's testimony that except for those two differences that he mentions, the rubber cushion, and the question of the magnet, the Stentor Autophone was basically the same as the ordinary commercial receiver?

A. I don't know as I understand that the way you put your question. Would you mind reading it again?

Q. Well, let me see if I can clarify it.

—1449—

The Court: Repeat the question.

(The question was repeated by the Reporter, as follows:

"Q. Well, then, would your answer be that you are unable to state whether you agree or do not agree with Mr. Critchfield's testimony that except for those two differences that he mentions, the rubber cushion, and the question of the magnet, the Stentor Autophone was basically the same as the ordinary commercial receiver?")

A. I am unable to agree or disagree, but not for that reason. I am unable to agree or disagree because I have no Stentor Autophone receiver which is referred to here which has been proved and which is represented to be such, on which to base my answer.

By Mr. Bernays:

Q. All right, sir. A. I have finished. Oh, I am sorry, there are other questions. 644:

"Q. The ordinary commercial telephone did have a permanent magnet, did it not?"

The answer:

—1450—

"A. The ones that I was familiar with did have."

Now, that fact was known to Mr. Critchfield; I mean to say, it is something that he said of his own knowledge, but I don't know that I am in a position to agree or disagree with what he knew or did not know.

Question 645:

"Q. But in the ordinary commercial telephone the diaphragm was fixed at the periphery so as to be made as nearly as possible immovable, was it not? A. I like the term used awhile ago, 'substantially immovable'."

I agree that that is a correct answer, that the ordinary commercial telephone receiver was—I am referring now to the Bell type telephone—was clamped around the periphery.

646:

"Q. I will be glad to use the term. That states exactly what I have in mind. And that was the exact point of difference in that respect between the ordinary commercial telephone receiver and the

—1451—

Stentor receiver, was it not?"

The answer is:

"A. That is correct."

I don't know what is meant there by Stentor receiver, and, therefore, lacking that knowledge, I have no way of checking up whether I agree or disagree with his answer.

The next question, 647:

"Q. Now, I think you told us yesterday, Mr. Critchfield, with respect to the transmitter that if you succeeded in getting in the transmitter what I shall refer to in brief terms as a movable diaphragm, you would get less distortion of the voice and better production of the voice than would be

the case with a transmitter in which a fixed diaphragm was used. Do I correctly recollect your testimony of yesterday in that respect? A. That is on the basis of all other things being equal?"

And another question:

"Q. Yes, of course."

—1452—

The answer was:

"A. Yes."

The question in this case is not specific and descriptive enough in order to agree or disagree, but I will say this in respect to it. If Mr. Critchfield in his answer was referring to the carbon granule type of transmitter, and if Mr. Critchfield was referring to a movable diaphragm of the type and of the mounting described in the Spence transmitter patent, then I do not agree with his answer.

"Q. Would that also be true as to the receiver portion of a telephonic mechanism? A. Yes, with the same reservation, all other things being equal."

To which I also disagree, making the same assumptions as I did in the previous question.

Q. Thank you, Mr. Kelley. Now, I would like to ask you about the testimony given with respect to the working of the Stentor Autophone by Mr. Frederick C. Kroeger, who at the time when we examined him was the general manager, I shall ask you to assume,— A. Yes.

—1453—

Q. —of this Remy factory, and who prior to that time and during the life of the agreement had had some contact with the manufacture and operations of the Stentor Autophone. Do I make my assumptions based on my rec-

ollection of the record clear to you? A. Yes, and I will assume them.

Q. Yes. Now, I am reading, Mr. Kelley, or about to read, from page 121:

"Q. * * * It was a characteristic of the Stentor Autophone, was it not, that it was a loud speaking device in the reproduction of the voice at the receiving end? A. Yes.

"Q. Now, with the ordinary telephone receiver, Mr. Kroeger, you know, do you not, that it has to be held to the ear in order to hear the sound? A. Yes.

"Q. And that, at any little distance from the receiver, the sound is not audible? A. If it is sufficiently far from the ear, yes, sir.

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"Q. Now, the precise point of the Stentor Autophone was, that the sound, as it came through the receiver, was audible without having any part of the mechanism of the receiver up against the ear; isn't that so? A. Approximately so.

"Q. If there is any inaccuracy in that statement, which is perfectly possible in view of my lack of knowledge on engineering subjects, will you correct the inaccuracy? A. There could be some distance that you were permitted, before you couldn't hear on the autophone. I will say it was substantially more than the telephone.

"Q. And, as a matter of fact, that precise point is called to the attention of readers upon this printed Delco-Remy instructions, which was Exhibit No. 1-30; is it not? The language to which I refer is as follows, Mr. Kroeger: 'Hold the transmitter close to the lips. If it is held in this manner, a sufficient loud signal will be transmitted, even

—1455—

though the passenger speaks in a low tone.' Is that right? A. Yes."

Now, having in mind the portion that I have just finished reading, which, again, is bracketed in red crayon, will you be good enough to tell me whether you agree or disagree with Mr. Kroeger's testimony? A. I might remind you at this time, Mr. Bernays, that my testimony had to do with the discussion of the Spence patents and the patents that were in the nature of prior art, and I have no knowledge of my own with respect to what these Autophones were, except as I have heard reference to them in the trial. Now,——

Q. And—excuse me. A. —that presents to me a difficulty in co-operating with you in respect to your question.

Q. Well, Mr. Kelley, if you can't—if in view of those circumstances you can't express either agreement or disagreement I shall not quarrel with you, I shall simply have to take your answer. A. Well, I will do the best I can.

Q. All right, sir. A. I will go through them question

—1456—

by question, as I did before. The first one is a question which has an introductory sentence,——

Q. That is right. A. —but I will omit that because I notice you have bracketed it out.

Q. That is right.

A. "Q. * * * It was a characteristic of the Stentor autophone, was it not, that it was a loud speaking device in the reproduction of the voice at the receiving end?" to which the answer is: "A. Yes."

I have no knowledge of just what that was, except what I have heard expressed from time to time. I recall

that Mr. Farmer said that in an Autophone the little horn that depends from the corner next to the chauffeur is right near his ear, and if that is so I do not agree with his answer that it is a loud speaking device.

The next question:

"Q. Now, with the ordinary telephone receiver,
—1457—
Mr. Kroeger, you know, do you not, that it has to be held to the ear in order to hear the sound?" and his answer was: "A. Yes."

I do not agree entirely with his answer. I think—that, of course, is the normal use of a telephone receiver, but if the telephone receiver was equipped with a horn, and if excessive currents, voice currents, were used in the coils surrounding the pole pieces, the ordinary telephone so modified would be a sort of makeshift loud-speaker, but I would not call it a loud speaking device. It would not—the moment you would do anything of that sort to it it becomes less intelligible as to reproduction than it was when it was used against the ear, and it is being used, when it is so used, with a horn, and with excessive voice current, in an abnormal way, so that I would not characterize it as a loud speaking device.

"Q. And that, at any little distance from the receiver, the sound is not audible? A. If it is sufficiently far from the ear, yes, sir."
—1458—

Well, I think I will have to agree with that, because you can get far enough away from anything not to hear it.

"Q. Now, the precise point of the Stentor autophone was, that the sound, as it came through the receiver, was audible without having any part of the mechanism of the receiver up against the ear; isn't that so? A. Approximately so."

Well, with the lack of personal knowledge of what the Autophone was I think that is probably correct.

"Q. If there is any inaccuracy in that statement, which is perfectly possible in view of my lack of knowledge on engineering subjects, will you correct the inaccuracy? A. There could be some distance that you were permitted, before you couldn't hear on the autophone. I will say it was substantially more than the telephone."

I do not agree with the answer as given, because he is comparing the Autophone with the telephone I assume

—1459—

under unequal conditions. That is, the telephone with normal operating currents in it, of course, could not compete with another telephone of a similar nature in which the currents were much stronger.

"Q. And, as a matter of fact, that precise point is called to the attention of readers upon this printed Delco-Remy instructions, which was Exhibit No. 1-30; is it not? The language to which I refer is as follows, Mr. Kroeger: 'Hold the transmitter close to the lips. If it is held in this manner, a sufficient loud signal will be transmitted, even though the passenger speaks in a low tone.' Is that right? A. Yes."

I should think that was just a matter of reading what it said on the instructions, and it does not call for agreement or disagreement on my part.

Q. Now, in one of your comments on Mr. Kroeger's testimony—I will leave it before you so that you can

—1460—

refer to it—you suggested that the comparison that Mr.

Kroeger was making between the Stentor Autophone and the ordinary telephone was on a basis which was not coparable because of the use of excessive current in one of the instruments? A. Well, I would have to assume that because otherwise—there were no amplifiers in the system, as I understand it, and I would have to assume that as a practical thing.

Q. And that is an assumption that you have made in several of your answers on your direct testimony, is it not? A. Well, you would have to be more specific. I don't know what you are referring to.

Q. Do you know of your personal knowledge that the Stentor Autophone was operated upon excessive currents? A. Not of my personal knowledge, no, sir.

Q. Now, Mr. Kelley, I am taking up Plaintiff's Exhibit 86, and taking the cap off the receiver, and ask you to assume with me that the magnet, the permanent magnet, had been taken out of this receiver. Do I make myself

—1461—

clear (indicating)? A. So far, yes.

Q. Now, if the permanent magnet being out of the receiver, I put the diaphragm as I am now setting it, there would be no pull upon the diaphragm, would there (indicating)? A. Under the conditions you have assumed, no, sir.

Q. Well,— A. That is—I wonder if you have by implication left out something else? There might be another source of magnetism.

Q. You mean an electro magnet? A. An electro magnet, yes, sir.

Q. No. A. Well, if you rule all magnets out,——

Q. That is right. A. —whether electrical or permanent magnet, then you are correct in saying there would be then no pull on the diaphragm when you place it as you are now.

Q. Now, there is in this receiver of Plaintiff's Exhibit

—1462—

86 a permanent magnet, however, is there not? A. Yes, sir.

Q. When I place this diaphragm upon its proper position in Plaintiff's Exhibit 86 just how much does that diaphragm bend? A. I have no figures on it.

Q. Have you any approximate figures? A. I don't recall what they are. They are rather small.

Q. It would be something that you would measure in a very few thousandths of an inch, wouldn't it? A. I don't know as it would get quite that small, but it would be small.

Q. Would it be as much as three one-thousandths of an inch? A. Well, I—I tell you, Mr. Bernays, I would be glad to tell you exactly if I happened to recall. I have known and have had information on that. Rather than be inaccurate and make a guess, I would rather not give a specific figure.

Q. Would you be able to—I don't want to press you beyond what you are able to tell me, but let me try this—

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would you be able to say whether it was as much as six one-thousandths of an ich, or am I still in the realm where you would feel too uncertain to give an answer? A. Well, I can tell you in other terms which are of direct importance as to the functioning of it. In other words, I can tell you in terms of the variations in flexure which accompany the use of the instrument,——

Q. No, I am coming to that. A. —in comparison with—in comparison with the permanent pull—or, rather, the pull of the magnet, whether it is permanent, or electro magnet.

Q. I was coming to that next. That is a matter of one or two per cent, you and Dr. Karapetoff have said. A. That is right, and that is the important factor.

Q. Yes, but what I want to get now, you see, is what is that one or two per cent of; in other words, what is the permanent pull which is varied by one or two per cent, as you and Dr. Karapetoff have told us. A. I

—1464—

don't——

Q. Do I make myself clear? A. Yes, but, as I said, I don't recall near enough exactly to give it to you, and rather than guess at it I will say that it is very small.

Q. Would you be able to state any outside measurement in thousandths of an inch beyond which it would not go. A. I have already answered your question, Mr. Bernays.

Q. I am sorry, I don't remember the answer. A. Well, the fact that, not recalling exactly how much it is, I would prefer not to make any guess at it, except to say that it is small.

Mr. Bernays: No further questions, Mr. Steel.

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—1465—

* * * * * * *

By the Court:

Q. Dr. Kelley, was it a part of the universal teaching of the telephonic art that for the transmission of intelligible sound the diaphragm should be light in weight, clamped at the periphery, and flexed at the center? A. In order to answer your Honor's question accurately, where the telephone—generally speaking, yes—and the telephone receiver of the type that we have been discussing, which has the clamped iron diaphragm, the ordinary

—1466—

telephone receiver, had to make a compromise and be as

light as it could be made and still have enough cross section in it for the magnetic flux to flow through. Otherwise, it would be difficult to get strong pull, so that as far as the construction of that receiver permitted, the answer to your Honor's question is, yes.

With respect to loud-speakers and other forms of telephone receivers the answer is still "yes", and very emphatically so, because in that case the lightness was achieved by not having to be bound down with an iron diaphragm, but very light material could be selected, and it could be shaped to give it rigidity, to hold its form in action, so the answer to your Honor's question is, "yes, sir".

Q. Then a patent that teaches a thick diaphragm, unclamped at the periphery, and not flexing at the center, would violate all universally accepted principles? A. Yes, sir, it would lead in no direction but to an instrument that was incapable of intelligible reproduction.

* * * * * * *

—1482—

Mr. Steel: May I present at this time, if Your Honor please, written motion on behalf of defendant for directed verdict, for the reasons which are stated in the motion, and I have here a short memorandum which I desire to submit to Your Honor in support of it.

The Court: Mr. Bernays, have you a copy of this motion?

Mr. Bernays: We are getting one now, sir.

Mr. Steel: It just came out of the machine, Your Honor.

The Court: Very good.

All of the several grounds of the motion are dealt with by the Court in its rulings on requests for instructions.

Charge of the Court.

Now, under the new equity rules, gentlemen, I understand that it is incumbent on the Court to make some ruling on the requests for instructions before you go to the jury. Counsel for each side have submitted written requests for instruction to the jury. All the requests have been considered.

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Plaintiff's requests numbered from 1 to 10, inclusive, are in substance approved and will be covered by the charge to the jury.

Defendant's requests numbered 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 25, 26, 28 and 30 are in substance approved and will be covered by the charge.

Defendant's requests numbers 1, 2, 9, 17, 18, 19, 20, 21, 22, 23, 24, 27, 29, 31, 32 and 33 are disapproved.

It may be incumbent upon the Court to make an immediate disposition of the motion for a directed verdict. That motion is denied.

* * * * * *

—1488—

Charge of the Court.

NIELDS, *J.*:

Gentlemen of the Jury: The Court congratulates you on according a patient hearing during hot weather to a rather lengthy case.

The complaint in this action alleges the breach of an agreement and consequent damages. Plaintiff is Stentor Electric Manufacturing Company, Inc., a New York corporation (hereafter referred to as "Stentor"). Defendant is Klaxon Company, a Delaware corporation (hereafter referred to as "Klaxon").

Charge of the Court.

Plaintiff was engaged in the manufacture and sale of electric telephone receivers and transmitters covered by patents. Defendant was a subsidiary of United Motors Company, engaged in the manufacture of electrical appliances and devices used principally in the automotive business.

The agreement between the parties upon which the complaint is based is dated May 20, 1918. Stentor agreed to sell and convey to defendant all of its assets of every nature except letters patent and the trade name "Stentor".

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In the agreement, plaintiff granted to defendant "the sole and exclusive right to make, have made, use and sell telephone and related apparatus and devices and articles made in accordance with" four United States letters patent issued to Jesse L. Spence. These patents were:

(1) No. 1,112,167 for improvements in telephone-transmitters, issued September 29, 1914;

(2) No. 1,112,392 for improvements in telephone-receivers, issued September 29, 1914;

(3) No. 1,235,851 for improvements in helmets for aviators, issued August 7, 1917; and

(4) No. 1,235,853 for improvements in electric cigar-lighters, issued August 7, 1917.

Plaintiff agreed that said license should remain in full force for the term of seventeen years from September 29, 1914 unless sooner terminated under the terms of the agreement.

In the agreement defendant covenanted to pay the plaintiff an amount equal to 50% of the net profits realized by defendant from the sale of apparatus, devices and articles manufactured and sold under said patents and

license; provided, however, that if the net profits were
—1490—
not equal to 30% of the cost of manufacture defendant was entitled to retain all of said profits up to 15% of the cost of manufacture. In the agreement defendant further covenanted (1) to "use its best efforts to further the manufacture and sale of the articles covered by the agreement"; (2) to "maintain an efficient organization for the manufacture and sale of said articles"; and (3) to refrain from manufacturing or selling for itself or for any other party any competitive or substitute articles.

In its complaint plaintiff alleges it performed and fulfilled all things to be performed and fulfilled by it according to the tenor and effect of its agreement.

The complaint charges that defendant (1) did not use its best efforts to further the manufacture and sale of the apparatus, devices and articles covered by the license agreement; (2) did not maintain an efficient organization for the manufacture and sale of said apparatus, devices and articles; (3) did not advertise, make sales efforts, employ salesmen or proper personnel for such sale and manufacture; and (4) did not use due efforts to develop a market for any of said apparatus, devices and articles.
—1491—
That shortly after the making of said agreement defendant refused to manufacture or sell or to attempt to manufacture or sell any of the apparatus, devices or articles embodying any of said inventions. As a result of said failures plaintiff has been deprived of large sums of money which would have been received by plaintiff under said agreement, and the value of said patents was destroyed by reason of the discontinuance of the sale of said apparatus, devices and articles and the failure of the defendant to further the sale thereof.

In its answer, defendant alleges that it has at all times fully performed all the terms of said agreement. Defend-

ant makes categorical answer to the allegations of each of the twenty paragraphs of the complaint. As to the seventeenth paragraph defendant alleges: That on July 1, 1924 it assigned and delivered to General Motors Corporation, the sole stockholder of defendant, all of its assets, and thereupon General Motors Corporation assumed all the obligations arising under said agreement of May 20, 1918; that thereafter Klaxon did not manufacture any devices and did not maintain any organization for the manufacture thereof; that plaintiff acquiesced

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in said transfer and in said discontinuance of manufacture of said articles by Klaxon.

Further answering paragraph seventeen, defendant alleges that it used its best efforts to further the manufacture and sale of the articles. Nevertheless, by reason of the great extent to which the fields occupied by the patents were limited by the patents and publications of the prior art and by reason of the fact that the end of the War lessened the demand for such articles and by reason of the faults inherent in the structure thereof, said articles were supplanted by other and different devices.

As a result, defendant concentrated its efforts in the manufacture and sale of those articles which, after changes in their structure, functioning and principle of operation, possessed some utility. Such articles included telephone transmitters and receivers in automobile telephones used in limousines. As the demand for limousines became less and less the demand for automobile telephones likewise diminished.

Further answering paragraph seventeen, defendant alleges that by reason of inherent defects in the structure

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and principle of operation of the telephone transmitter and receiver patents and of the helmet patent and by

reason of the appearance upon the market of cigar lighters differing in form, structure and mode of operation from the cigar lighters patent, the efforts of General Motors Corporation to further the manufacture and sale of the articles covered by said agreement were fruitless. However, royalties were paid by defendant and by General Motors Corporation and its affiliates to plaintiff for all devices made and sold by them of the general character of the devices covered by said letters patent.

Annexed to and as part of the answer defendant sets up 20 separate and distinct defenses. These defenses lend themselves, in part, to group treatment. Instead of dealing with them separately and at length I shall mass them into groups.

Defenses 1 and 20 may be considered together. "1" alleges that the complaint fails to state a claim upon which relief can be granted; "20" alleges that the obligations of defendant under the agreement of May 20, 1918 are so vague, indefinite and uncertain as to be invalid. Clearly the complaint states a cause of action, and these defenses are overruled.

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Defenses 2, 3, 4, 9, 10 and 18 are classed in one group. "2" alleges that plaintiff is not a party to the agreement of May 20, 1918; "3" that said agreement is not signed or sealed by defendant, and consequently is of no legal effect; "4" that the seal affixed to the agreement purported to be the seal of a corporation other than plaintiff; "9" that Stentor Electric Manufacturing Company (without the abbreviation "Inc." at the end thereof) was not the owner of the patents recited in said agreement, and consequently the recital in the agreement constitutes a misrepresentation of a material fact; "10" is like "19"; "18" that the agreement was never executed as contemplated, in that, the seal of Stentor Manufacturing Company (omitting "Inc." at the end thereof) was not affixed

to the agreement and that the seal of neither party was duly attested by its secretary.

The substance of these defenses is that Stentor Electric Manufacturing Company, Inc., the plaintiff, is not a party to the agreement. For several years defendant paid a division of profits to plaintiff and plaintiff accepted the same according to the terms of the agreement. The conduct of the parties provides the practical con-

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struction of the agreement. This conduct and the documentary evidence establishes that plaintiff is a party to the agreement and these defenses are accordingly overruled.

Defenses 5 and 6: "5" alleges that the agreement is not a sealed instrument and that rights of action based thereon are limited by the three year statute of limitations; "6" alleges that in 1918 the agreement was modified by writings not under seal and was converted into a simple contract subject to the three year statute of limitations.

If the jury shall find that the writings not under seal did modify the agreement in certain parts, the Court charges you, as a matter of law, that said writings not under seal did not affect the essence of the contract and therefore did not reduce the sealed agreement to a simple contract. The agreement remained a sealed instrument and was not subject to the three year statute of limitations. Accordingly these defenses are overruled.

Defense "7" assumes that the statute of limitations does not run from the date the cause of action accrues but from the date the cause of action is pleaded. This

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assumption is unsound and the defense is overruled.

Defense "8" alleges that plaintiff neglected seasonably to assert rights of action against defendant, but asserted

such rights only after plaintiff had acquiesced in the acts complained of; that by reason of such neglect on the part of plaintiff, defendant has been deprived of the testimony of many witnesses now deceased and of the benefit of books, papers, records and documents mislaid, lost or destroyed. The record is devoid of any evidence to sustain this defense, and the same is overruled.

Defense "12" alleges that the agreement amounts to a sale and assignment, and not a license, and therefore defendant is free to declare the patents invalid. The agreement does not recite an assignment. It contains an exclusive license. Since the licensee enjoyed the benefits of its license, as licensee it can not be heard to question the validity of the patents. This defense is overruled.

Defense "13" alleges that the claims of the patents are so limited in their scope that the patents were of no

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practical or commercial value. It is for the jury to determine whether or no the patents were limited to the devices specified therein and whether the patents so limited were of any commercial value.

Defense "14" alleges that on or about July 1, 1924, defendant assigned to General Motors Corporation, its sole stockholder, substantially all of its assets and thereupon General Motors Corporation assumed all the obligations of defendant under the agreement; that this fact was made known to plaintiff promptly after said assignment; that at all times thereafter plaintiff acquiesced in the transfer and accepted performance under the agreement by General Motors and its affiliated companies, in lieu of performance by defendant; by reason whereof a novation was effected; whereby defendant was released from all liability under the agreement.

The requisites of a novation are (1) a valid prior ob-

ligation to be displaced; (2) the consent of both parties to the substitution; (3) a sufficient consideration; (4) the extinguishment of the old obligation; and (5) the creation of a valid new one. The evidence establishes that these requisites are here wanting, and this defense

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is overruled.

Defense "15" alleges that plaintiff is without right of action based upon alleged failure of defendant to use its best efforts, in that, the efforts of defendant have been acquiesced in and accepted by plaintiff as full performance; wherefore plaintiff has waived any right to assert that any covenant of the agreement has not been performed.

Waiver is an intentional relinquishment of a known right. An intent to surrender a right is the foundation of a waiver. If you find from the evidence that the plaintiff did not relinquish the right to have defendant fully perform its obligations under article 13 of the agreement, then the court instructs you that there was no waiver and you may disregard this defense.

Defense "16" alleges that defendant was induced to become a party to the agreement by reason of plaintiff's fraud; that the fraud consisted, in part, of representations made to defendant by plaintiff that the patents recited in the agreement were good and that the devices were of great utility; that orders were being received by defendant from the United States Navy without solicitation; and that the business of plaintiff con-

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sisting of the manufacture and sale of the devices had been conducted at a substantial profit; whereas, in truth and in fact, said patents were valueless and the devices were based upon unsound principles.

Fraud is never presumed. Whenever it is relied upon it must be proved to the satisfaction of the jury. The

burden of proof is upon defendant. It is incumbent upon defendant to establish by clear, satisfactory and convincing evidence that it entered into the contract as a result of the fraud of plaintiff.

Defense "19" alleges that General Motors Corporation, its subsidiaries or affiliates, have paid to plaintiff sums of money; that said sums of money were accepted by plaintiff in full satisfaction and discharge of all liability, if any, of defendant and of all damages which plaintiff sustained to and including March 31, 1928. This is a sound defense if fully proved.

This case has held your attention for a considerable time. But the court does not hesitate to say to you, gentlemen, that the substantial issues are within a narrow compass.

The uncontradicted evidence is that there was a contract between the parties to this action under date of

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May 20, 1918. A contract would not be worth anything, as a contract, unless it was an obligation binding as between the parties which neither has the right at his own option to rescind unless the contract has been repudiated by one of the parties. There being a contract, it is for you to determine, whether there was a breach of that contract by defendant and, if so, in what particular the contract was broken by defendant.

If you find there was a breach, you will then determine what was the damage to the plaintiff flowing therefrom.

In article 13 of the agreement of May 20, 1918, defendant covenanted: "The Klaxon Company * * * will use its best efforts to further the manufacture and sale of the articles covered by this agreement, and to that end it will maintain an efficient organization for the manufacture and sale of said articles."

"Best efforts" in the agreement, mean the use of all

reasonable skill and diligence to further the manufacture and sale of the articles covered by the agreement, to the end that profits should be earned in which plaintiff would share. You are to apply to those words—"best

—1501—

efforts" your common sense and sound business judgment, taking into account all the relevant facts supplied by the proof such as the defendant's means, its business experience, organization, and its financial, technical and industrial capacity. The obligation of the defendant to use its best efforts to further the manufacture and sale of the articles covered by the agreement applies as well to defendant's additional obligation to maintain an efficient organization for the manufacture and sale of the articles covered by the agreement. If you find that the defendant did not use its best efforts to further the manufacture and sale of the patented articles or did not maintain an efficient organization for the manufacture and sale of said articles, then you will find that the defendant broke its contract.

To show that the defendant broke its agreement there must be proved to your satisfaction, that defendant failed to expend such efforts as in the exercise of sound business judgment would be likely to produce profitable results, or failed to expend such efforts as an experienced manufacturer of ordinary care and prudence would expend

—1502—

under like circumstances, having regard for his own interest as well as that of the plaintiff.

Before you can find that the defendant did not use its best efforts to further the manufacture and sale of the articles covered by the agreement of May 20, 1918 and that it did not maintain an efficient organization for the manufacture and sale of such articles, you must first find that the articles covered by the patents possessed commercial value and utility sufficient to justify their

manufacture and sale. The defendant was not obliged under its agreement to manufacture and sell the articles covered by the patents for use in the radio or other fields unless the patented articles were suitable and practical for use in those fields.

You may recall, that defendant's expert Kelley testified that in the telephone art, before and after 1918, it was universally recognized that a diaphragm should be thin, fastened at its periphery and flex at its centre. In his patents Spence taught, according to the expert, that the diaphragm should be rigid, should be unfastened at its periphery and should not flex freely at the centre. In

—1503—

short, that Spence repudiated the universally accepted teachings of the art. It is for you to determine from the proof whether or no apparatus or devices covered by the Spence patents were marketable products.

You may have observed, gentlemen, that plaintiff claims damages from two separate and distinct lines of conduct on the part of the defendant. First, damages in respect to articles manufactured; and second, damages occasioned by failure to manufacture.

The general rule is that all damages resulting necessarily, immediately and directly from the breach of a contract are recoverable and not those that are contingent and uncertain. Damages are not rendered uncertain because they can not be calculated with absolute exactness. It is sufficient if a reasonable basis of computation is afforded.

The fundamental principle of law upon which damages for breach of contract are assessed is that the injured party shall be placed in the same position he would have been in, if the contract had been performed. So far as loss can be ascertained it must follow as a natural consequence and be within the contemplation of reasonable men as a probable result of the breach. Compensation

—1504—

therefor in money must be computed by rational methods upon a firm basis of fact. When a claim for prospective profits is brought to the test of this principle recovery can be had where loss of profits is the proximate result of the breach and in the common course of events may have been expected at the time the contact was made to ensue from a breach. Profits can not be recovered when (the contract interpretated in the light of all its surroundings does not appear to have been made in contemplation of such damages, or when) they are remote, or so uncertain, contingent or speculative as not to be susceptible of trustworthy proof. They must be capable of ascertainment by reference to some definite standard, either of market value, experience, or direct inference from the facts proved.

The proof is that the agreement in suit was entered into upon a profit sharing basis. "Net profits" were within the actual contemplation of the parties. They are therefore a proper basis for the award of damages. "Net Profits" as used in the agreement is the difference between the selling price and the cost of manufacture. "Cost of Manufacture" includes the actual cost of labor

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and material entering into the production of such articles together with a suitable portion of overhead and selling expense connected therewith and all taxes, depreciation and losses in the manufacture and sale of all devices covered by the license. You will ask yourselves, What will be the amount which it is reasonably certain from the evidence in the case that the plaintiff would have received as its share of the net profits if defendant had carried out the agreement according to its terms?

You may take into consideration the evidence of the practice of the defendant in selling to affiliated companies in the General Motors group at lower prices than it

charged outsiders provided that you are satisfied that such sales could have been made to the affiliated companies at the prices charged outsiders.

In considering damages you are entitled to take into consideration the merits and commercial salability of the Spence receiver and transmitter; the markets which existed for those products from May 20, 1918 to September 29, 1931; the prices at which such products could have been manufactured and sold and the profit thereon; the competition in the market of similar products offered for sale by other manufacturers and sellers; and the

—1506—

ability of the defendant to compete in the markets.

If you find that the evidence is conflicting, you should reconcile that conflict if you can. If you can not, you should be governed by that portion of the testimony which you believe to be worthy of credit and reject that part, if any, which you believe to be unworthy of credit. There is a general presumption in favor of honesty and fair dealing between men. There is also a presumption in favor of the truthfulness of men when testifying under oath. These presumptions are not conclusive and may be overcome by evidence direct or circumstantial.

You will understand that you are not bound by anything that the Court has said regarding the facts. The jury is bound in the performance of its duty to follow the law laid down by the Court. As to the facts, you are entirely free to find, as you see fit, in accordance with the principles of law given you by the Court. In mentioning facts the sole purpose of the Court is to assist the jury but not to usurp or attempt to usurp the power belonging to them.

In a civil case your verdict should be in favor of the party having a preponderance of the evidence in its

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favor. A preponderance of evidence is not usually de-

termined by the number of witnesses,—that is only one element. One or two witnesses on one side may have more weight than a dozen on the other. If you find a preponderance of evidence in favor of the plaintiff you should return a verdict for the plaintiff, but if you find such preponderance of evidence in favor of the defendant you should return a verdict for the defendant.

If you find from the evidence and under the principles of law given to you by the Court that the defendant broke its contract your verdict should be for the plaintiff in such amount as will compensate it for the damages flowing from such breach. If you do not so find your verdict should be for the defendant.

The Court has been requested to give you instructions on a number of points of law in the language employed by counsel. The charge of the Court embraces in substance all of the propositions suggested by counsel in so far as those propositions are, in the opinion of the Court, properly applicable to the case.

Swear the bailiff.

—1508—

Mr. Steel: May it please the Court, before the jury retires to consider the evidence may I have a moment to confer with my associates with respect to the charge?

The Court: Certainly.

Mr. Bernays: May I make that request on behalf of the plaintiff, also?

The Court: Certainly.

Mr. Bernays: Thank you, sir. Plaintiff has no requests.

Mr. Steel: May I inquire of the Court whether if there be a discussion with respect to the charge to the jury under the rules that is required to be done in the presence of the jury, holding them here, or in the absence of the jury?

The Court: Take your own course.

Mr. Steel: Well, is there a provision in the rule? I think there is.

The Court: I may say, gentlemen, that if and when you desire a lunch the Marshal will provide it.

The rule ends by saying: "Opportunity shall be given to make the objection out of the hearing of the jury."

—1509—

Mr. Steel: I wonder whether we might have that privilege, if your Honor please. The jury has been here all morning. I don't like to hold them up. I think we can state our views with respect to the charge probably very shortly.

The Court: You can be accorded any privilege provided by the rules. Twelve jurors, which, of course, would exclude Mr. Beebe and Mr. Plumstead, may retire to the jury room.

(The jury retired.)

* * * * * * *

Mr. Steel: May it please the Court, my associates who were listening to your Honor tell me that there were several of the paragraphs of our prayers which your Honor's memorandum indicated would be granted or covered

—1510—

by your charge that were not in fact covered. I did not check against it as I went down the line. I am advised by my associate that the prayers which I have reference to are 28, 26, 25, 16, 15, 14 and 13.

The Court: Just number those again, please.

Mr. Steel: Oh, I am sorry; 13, 14, 15—may I run down them as your Honor does? Maybe we can straighten it up very quickly. May I just check these very hastily?

The Court: Certainly.

Mr. Steel: It seems to me, if the Court pleases, I have

checked through these, that the 15, 16 and 28 were not covered by your Honor's charge, and notwithstanding the memorandum seemed to indicate that they might be. Now, it may be that in listening to your Honor I inadvertently neglected to——

The Court: The Court will stand upon the language of the charge, which is: "The Court has been requested to give you instructions on a number of points of law in the language employed by counsel. The charge of the Court embraces in substance all of the propositions suggested by counsel in so far as those propositions are,

—1511—

in the opinion of the Court, properly applicable to the case."

Mr. Steel: May I place this objection, if your Honor pleases, upon the record, that as I understand the decisional law the question of whether or not damages in a given case are speculative or not speculative is a question of law for the Court to determine from the evidence, and not a question for the jury to determine from the facts which have been laid before it. I think that the Circuit Court of Appeals for the Third Circuit has pretty clearly stated that rule on several occasions, if I may advert to one or two of those decisions. Or, may I first refer to a Supreme Court of the United States decision which is in 138 U. S.:

> "A lack of certainty as to terms of contract obligations of either party, or measure of damages for breach, is simply the misfortune of him who seeks to recover in case of a breach thereof. * * * The court should have charged the jury that, in reference to the machines other than the Dolph machines, there could be none other than a recovery of nominal damages."

Now, the Circuit Court of Appeals decisions which I
—1512—
refer to are, first, Iron City Toolworks, Limited v. Welisch, in 128 Federal 693, in which the Court said:

> "We are of opinion that the learned judge in the court below erred in submitting to the jury, as a basis for their computation of damage, the question of what profits the plaintiff might have gained by the sale of the picks, had they been delivered to him by defendant, according to contract."

Again, in the case of Gurran v. Smith, which was the Third Circuit, in 149 Fed. 945, the decision of the lower court was affirmed in a per curiam decision, the lower court having said:

> "I therefore find as a matter of fact, as well as of law, that the profits claimed to have been lost by the plaintiffs by the failure of the defendants to perform the agreement in suit were uncertain, speculative, and doubtful, and cannot be allowed."

Now, that is an objection which I do desire the record to show.

Further, if your Honor please, if the question of the
—1513—
measure of damages is to be left to the jury, and particularly the question of whether or not they are speculative, it seems to me that any charge which was made to the jury on the subject should specifically state that if the jury finds that there has been a breach of the contract by the defendant, but likewise finds that the damages are speculative or remote, then it is the duty of the jury to return a verdict for the plaintiff in the

amount of six cents. That phase of my objection was not covered by your Honor's charge.

The Court: However, I think it is.

Mr. Steel: Very good, sir.

The Court: Expressly.

Mr. Steel: In your Honor's charge as I understood it you stated that damages were sought for two reasons, first, with respect to articles which had been manufactured, and, secondly, with respect to articles which had not been manufactured. The complaint which was filed in the case does charge as your Honor has indicated, that the defendant was selling substituted or competing devices in violation of the terms of the agreement. However, yesterday counsel for plaintiff stated to your

—1514—

Honor that there had been no evidence introduced in support of that charge, and that, therefore, it was abandoned. Therefore, I think it is error or objectionable, if the Court please, to submit a question of that sort to the jury, where it has been abandoned by counsel and where there is no evidence in the record to support it.

The Court: There was no abandonment of the lower prices of the devices sold to Fisher Body.

Mr. Steel: I am not speaking about that, if your Honor please.

The Court: Well, that is what the charge was about.

Mr. Steel: Well, now, with respect to the lower prices of the articles sold to Fisher Body I think the record in this case will show that there is no evidence of any character subsequent to July 27, 1926, which was the date of the Parker memorandum, which indicates that there was ever a penny's worth of discrimination between Fisher Body and any other purchaser, and the record being void of evidence of that character it seems to me, likewise, it is a mistake for that question to be left to the jury.

—1515—

May I just check the notes here very quickly?

The Court: Oh, certainly. Take your own time.

Mr. Steel: May I likewise for record purposes state my view that there has been evidence introduced which casts doubt upon the fact of whether or not the Stentor Electric Manufacturing Company, Inc., was a party to the agreement, and that, therefore, that question should have been left for the jury rather than taken away from it.

Likewise may I state for purposes of the record that there was evidence that this contract was modified by subsequent parole writings which changed the character and made applicable the Statute of Limitations.

Likewise, if I may state for the record, in my view there is evidence in the record which goes to the question of the death of witnesses during the intervening period of delay, and loss of documents, which should have permitted the question of laches, likewise, to have gone to the jury rather than to have been taken from it.

—1516—

I likewise desire to place an objection to your Honor's charge that as a matter of law this instrument of writing was a license rather than an assignment.

I desire further to file an exception to your Honor's charge to the effect that as a matter of law there was no novation effected, that there was no evidence on that subject to support such a finding. That, it seems to me, was likewise properly a jury question.

Likewise, with respect to your Honor's charge as to accord and satisfaction, you stated, as I recall, that that was sound in law if fully proven. The jury was not told what the consequences should be if they should find from the facts that there had been an accord and satisfaction.

If you will indulge me a second I will see whether my friends have any other thought.

Objections to Charge.

I desire specifically to object to your Honor's refusal to charge the jury in accordance with prayer 9 of our prayers, for the reasons which I have heretofore stated, namely, that as a matter of law when damages are specu-

—1517—

lative that fact should be charged to the jury.

Likewise I desire to except or object to your Honor's disregard of prayer 17, which is the prayer which relates to the duty of plaintiff to mitigate or minimize damages. As we conceive the law that was a responsibility which was placed upon the plaintiff and the jury should have been so charged.

The same objection goes to paragraph 18 of our prayers, and the same likewise with respect to paragraph 19, and the same with respect to paragraph 20, also; likewise, the same objection to paragraph 21, that all going to the question of mitigation of damages.

Paragraph 22 of the prayers has been disregarded. They are the modifying or amending letters, and I have already referred to that. The same with respect to paragraph 23.

I likewise desire to object to the Court's disregard of paragraph 24, which, as we conceive, is sound in law under the authorities which are cited in the prayers.

May I have the same observations to make with respect to paragraph 27?

I likewise desire to object to your Honor's disregard

—1518—

of paragraph 29 upon the ground that the charge therein sought is soundly conceived in law under the authorities which we have given your Honor, and others of like purport.

Likewise, I desire to object to your Honor's refusal to charge in accordance with prayer 31, which relates to the Parker memorandum to Wilson, which is a pre-

judicial memorandum and not pertinent to the issues in the case.

I likewise desire to object to your Honor's disregard of prayer 32 in your charge with respect to accord and satisfaction, in so far as your Honor failed to amplify and expand the applicable law in accordance with prayer 32.

I have already referred to prayer 33 with respect to laches.

Now, if I may have a moment—I likewise desire to object to your Honor's charge that the profits are a proper subject of damages, and also to your Honor's disregard of our prayers 10, 11 and 12, which pertain more particularly to the question of the speculative nature of the damages in the case.

The Court: Is that all?

—1519—

Mr. Steel: Yes, sir.

The Court: Each and all of the exceptions and objections are overruled and denied.

Bring in the jury.

Mr. Steel: May I have an exception, if your Honor please?

The Court: Certainly. Let an exception be entered.

(The jury returned.)

The Court: Gentlemen, a number of exceptions and objections have been made, all and each of which have been overruled.

Swear the bailiff.

(The bailiff was sworn by the Clerk.)

The Court: Now, you may retire. The Court will recess until two o'clock.

(Recess, 12.53 until 2 o'clock P. M.)

(At 5.17 P. M. the jury returned.)

The Court: Gentlemen of the jury, you have sent a

communication to the Court containing two questions, and it reads thus: Under Article 17th of the contract

—1520—

between Stentor and Klaxon dated May 20, 1918 the Klaxon Company had the right upon thirty days notice to Stentor to cancel the contract provided when by reason of obsolescence of the articles covered by said patents a net profit of fifteen per cent could not be secured by the Klaxon Company? In answer to that question the Court instructs you if you find that the articles covered by the agreement were or become obsolete, and if you find in addition that Klaxon could not earn a profit of fifteen per cent upon the sale of such obsolescent articles, then Klaxon had the right to cancel the agreement upon giving thirty days written notice by registered mail to Stentor, under Article 17th of the agreement.

The second question is: Could Klaxon have cancelled the contract without agreement with Stentor that the articles covered by said patents were obsolete? The Court instructs you: You further ask, "Could Klaxon have cancelled the contract without agreement with Stentor that the articles covered by said patents were obsolete?" If you find from the proof that the articles were or become obsolete the answer to this question also is "Yes".

—1521—

You may retire into your chamber.

(The jury retired.)

The Court: You desire to say something?

Mr. Bernays: Could I be heard, sir, on this question to which your Honor has just given instructions? My recollection of the record is, and I think that the point is a very clear one so far as the state of the record is concerned, that Mr. Hollister testified that no notice of cancellation by reason of claimed obsolescence was ever sent, and that no action was taken by the Klaxon Com-

pany at any time during the life of the agreement availing itself of any right of cancellation by reason of those provisions of Article 17th of the agreement, and I respectfully request your Honor, if your Honor's recollection of the record is in accord with ours, as to the record being uncontradicted on those points, so to advise the jury by an appropriate instruction.

The Court: Have you something also to add?

Mr. Steel: I should like to have an opportunity to examine the agreement, but if I recall it, your Honor, it seems to me that the record likewise clearly shows

—1522—

that as late as 1927, and possibly thereafter, there was some division of profit with the Stentor Company, so that the jury must be instructed that the cancellation clause in no event could have become effective until after the last date when the record shows that there was a division of profits. That was a plaintiff's exhibit, it was a forty-some exhibit, which shows there was a payment to Stentor; in fact, there was a payment to Stentor in 1930, as I recall.

The Court: The responsibility for answering questions propounded by the jury falls to the Court, and that duty has been discharged so far as the Court knows. The question propounded has been answered.

Now, do you desire to note anything further?

Mr. Bernays: No, sir.

Mr. Steel: Will you indulge me just a second?

(The jury returned at 6:20 P. M.)

Mr. Mahaffy: Gentlemen of the jury, please answer to your names and bear with counsel.

(Each jury man responded to the call of his name.)

Mr. Mahaffy: Gentlemen, have you agreed upon your

—1523—

verdict? Who shall answer for you? How say you, Mr. Foreman, do you find for the plaintiff or for the defendant? For the plaintiff or for the defendant?

Juror Number 1: We find a verdict for the plaintiff of one hundred thousand dollars.

Mr. Mahaffy: For the plaintiff or for the defendant?

Juror Number 1: For the defendant——

Mr. Mahaffy: For the Stentor Electric Manufacturing——

Juror Number 1: We find a verdict for the plaintiff.

Mr. Mahaffy: Plaintiff; just a minute.

Juror Number 1: One hundred thousand dollars.

Mr. Mahaffy: One hundred thousand dollars?

Juror Number 1: One hundred thousand dollars.

Mr. Mahaffy: Gentlemen of the jury, hearken to your verdict as the Court hath recorded it. Your foreman says that you find for the plaintiff and assess its damage at the sum of one hundred thousand dollars, and so say you all.

—1524—

Mr. Steel: May it please the Court, may I respectfully request that the jury be polled individually with respect to their verdict generally, and that they likewise be polled individually with respect to the manner in which the damages were arrived at?

The Court: Let the jury be polled.

Mr. Mahaffy: Gentlemen of the jury, your foreman found a verdict for the plaintiff and assessed its damages at the sum of one hundred thousand dollars. Thomas B. Helm, is that your verdict?

Mr. Helm: Yes, sir.

Mr. Mahaffy: Elmer Dickerson, is that your verdict?

Mr. Dickerson: That is the verdict we arrived at.

Mr. Steel: I didn't get the jury man's answer.

Mr. Mahaffy: It is?

Mr. Dickerson: Yes.

Mr. Mahaffy: It is. Norman W. Coleman, is that your verdict?

Mr. Coleman: Yes, sir.

—1525—

Mr. Steel: What was the juryman's first answer?

Mr. Leahy: That was the verdict.

Mr. Steel: Did you get the juryman's first answer?

The Reporter: "That is the verdict we arrived at."

Mr. Mahaffy: William Virden, is that your verdict?

Mr. Virden: Yes, sir.

Mr. Mahaffy: J. Ewell Calhoun, is that your verdict?

Mr. Calhoun: Yes, sir.

Mr. Mahaffy: Brooks L. Ross, is that your verdict?

Mr. Ross: Yes, sir.

Mr. Mahaffy: William B. Waggamon, is that your verdict?

Mr. Waggamon: Yes, sir.

Mr. Mahaffy: Raymond L. Warren, is that your verdict?

Mr. Warren: Yes, sir.

Mr. Mahaffy: Leon H. Ryan, is that your verdict?

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Mr. Ryan: Yes.

Mr. Mahaffy: John W. Loud, is that your verdict?

Mr. Loud: Yes.

Mr. Mahaffy: Gussie T. Rust, is that your verdict?

Mr. Rust: Yes.

Mr. Mahaffy: William E. Wilson, is that your verdict?

Mr. Wilson: Yes.

Mr. Steel: Now, may it please the Court, my request was that the jurors be polled with respect to the manner in which the damages were arrived at.

The Court: That request is denied.

Mr. Steel: Thank you, sir. When your Honor came in to last address the jury I recollect your Honor having made the statement that notes of some sort had been passed from the jury to the Court, and if I recall, from the Court to the jury. May I respectfully request that each of those communications be marked in some identifiable way at this time?

The Court: If it is appropriate they shall be.

—1527—

Mr. Steel: May I have a ruling, sir?

The Court: In due season the ruling will be made by what is done. Do you desire to except?

Mr. Steel: I desire to have a ruling from your Honor on the point——

The Court: Yes.

Mr. Steel: —at the earliest time.

And may I likewise cause the record to show that from 2:30 on, at least, that is to say, from the time your Honor left the bench at the conclusion of the Midland Utilities hearing, I was either personally present in court or in the corridors of this floor, during the time when I was on the corridors of this floor persons in my office were in the court room and available to be heard with respect to the communications, and no opportunity to be heard with respect to them was afforded to us.

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The defendant submitted the following prayers for jury instruction:

"DEFENDANT'S PRAYERS FOR JURY INSTRUCTION.

The defendant in the above-entitled cause prays the Court to charge the jury as follows:

1. That your verdict must be for the defendant.

In the event that the Court should refuse to instruct the jury as prayed for in paragraph 1 hereof, the defendant prays the Court to charge the jury as follows:

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* * * * * * *

5. That you cannot find that defendant did not use

its best efforts to further the manufacture and sale of the articles covered by the agreement of May 20, 1918, and that it did not maintain an efficient organization for the manufacture and sale of such articles, unless you can first find that the articles, devices and apparatus covered by the patents possessed commercial value and

—1530—

utility sufficient to justify their manufacture and sale.

6. That you cannot find that the defendant should have attempted to manufacture and sell the devices, apparatus and articles called for by the patents, for use in the radio field or art, unless you can first find that the devices, apparatus and articles of the patents were suitable and practical for use in that field or art.

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—1531—

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9. That, if you find that the plaintiff and the defendant entered into the agreement of May 20, 1918, and that the defendant failed to use its best efforts to further

—1532—

the manufacture and sale of the articles covered by the agreement, and that it failed to maintain an efficient organization for the manufacture and sale of such articles, nevertheless, under the evidence which has been introduced, the plaintiff is entitled to recover nominal damages only. Therefore, if your verdict is for the plaintiff, it shall in no event exceed the amount of Six Cents (6¢).

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—1533—

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16. That, if you find with reasonable certainty from

the evidence the amount of the net profits the defendant would have made, had it used its best efforts to manufacture and sell the articles covered by the agreement, and had it maintained an efficient organization for the manufacture and sale of such articles, then, if your verdict is for the plaintiff, if shall be only in the amount of Six Cents (6¢), unless you find with reasonable certainty that such net profits would have been in excess of fifteen per cent. (15%) of the cost of manufacture, as heretofore defined.

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—1534—

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27. The Spence receiver patent conferred no authority upon the defendant to manufacture the cone or dynamic type of radio receiver. This is true, even though it be assumed that the words of the claims of the Spence receiver patent read upon the diaphragm and mounting of the cone or dynamic type receiver.

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—1535—

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31. That you shall disregard entirely the contents of the memorandum from L. O. Parker to C. E. Wilson, dated July 27, 1926, which is Plaintiff's Exhibit 38, for

—1536—

the reason that the contents of such memorandum have no relationship to or bearing upon the issues in this case and are in all respects without pertinency or relevancy to such issues.

* * * * * * *

Plaintiff's Exhibit 4.

UNITED STATES PATENT OFFICE.

JESSE L. SPENCE, OF NEW YORK, N. Y., ASSIGNOR TO ELECTRICAL EXPERIMENT COMPANY, INC., A CORPORATION OF NEW YORK.

TELEPHONE-RECEIVER.

Specifications of Letters Patent.

1,112,392. Patented Sept. 29, 191

Application filed June 6, 1913. Serial No. 772,086.

To all whom it may concern:

Be it known that I, JESSE L. SPENCE, a citizen of th United States, residing at New York, in the county New York and State of New York, have invented certai new and useful Improvements in Telephone-Receiver and I do hereby declare the following to be a full, clea and exact description of the invention, such as will enabl others skilled in the art to which it appertains to mak and use the same.

The present invention has reference to an improvemen in the art of sound transmission and to a specific mecha ical means for practising the same.

The principal object of the invention is the tran mission of sounds in their original purity, free from di tortions or modifications introduced by the characteristi of the instrument, and more particularly to deliver the receiver a sound of such considerable magnitud combined with clearness of enunciation as to make possible clearly to hear spoken words at some distan from the receiver.

Exhibit P-4.

One of the principal causes of the transmission or telephones of distorted or modified sounds is found in the fact that the diaphragms used are so mounted as to impose upon the controlling magnetic waves an external or artificial vibratory law, due either to their own bending or to the law of vibration of attached springs.

My method of operation involves the use of diaphragms so mounted as to yield as a whole to the magnetic impulses, producing movements of translation only. Such diaphragms are substantially inflexible under the stresses to which they are normally exposed. It is one feature of my method that I preserve freedom from external vibratory laws in my diaphragms.

The specific mechanical means preferably employed in putting into practice my invention is shown in the accompanying drawings wherein—

Figure 1 is a vertical section of a receiver, Fig. 2 is a face view of the same after removal of the cover ordinarily employed.

Within the casing 10 is mounted the usual magnet 11 preferably arranged with its two pole pieces 12 presented symmetrically on opposite sides of the center of the diaphragm 13. This arrangement lessens any possible tendency to flexure of the diaphragm under the influence of a sudden and violent change of magnetic force.

The diaphragm 13 is given an aperiodic mounting with its edge against a delicate air cushion between it and the magnet, and this mounting involves a pressure against the cushion so light that said cushion yields readily during use of the receiver, permitting a movement of translation of the diaphragm, substantially without flexure thereof. This mounting preferably takes the form of a pair of such cushions 14 and 15 of annular shape and having thin rubber walls. I have found that, within the expected limits of vibration, these cushions oppose a

substantially constant resistance, and do not impose any external vibratory law upon the movements of the diaphragm as would be the case with springs attached to the same. The cushions and diaphragm are kept in place by a cover 16 having the usual opening 17 for the sound.

I have found that a receiver constructed as described produces a movement of substantially pure translation in the diaphragm which preserves its parallelism to the plane of silence; and that singularly correct voice transmission is obtained with great sound volume.

It will be seen that my improved receiver comprises a diaphragm, mounting-cushions and magnet so constructed and proportioned, as to magnet strength, diaphragm thickness and delicacy of air cushion mounting, that the diaphragm has a practically aperiodic action under the expected conditions of use. For this purpose it is only necessary that the mutual pressures exerted between diaphragm and cushion during normal use, shall be consistent with delicate, responsive and practically aperiodic resilience in the cushion; while, at the same time, such pressures shall never be sufficient to produce such a flexure of the diaphragm as will materially affect the quality of sound production.

I am aware that air cushions have been used in certain classes of acoustic instruments for the purpose of firmly clamping the edges of the diaphragms intended to act by flexure. Diaphragms so mounted and operating are not aperiodic in nature, but tend to impose a vibratory law foreign to that of the sound to be projected; especially when associated with external springs or levers attached to the diaphragm.

I have found that, where a relatively rigid diaphragm is lightly enough confined against a pneumatic cushion at its edge, this cushion exerts an aperiodic resilience, which leaves the diaphragm free to conform its move-

ments as a whole to the particular vibrations which correspond to the magnetic changes in the telephone receiver. Such a cushion acts merely to hold up the diaphragm when current is cut off, and to preserve its proper angular position with respect to the magnet at all times. It also affords a bar to passage of air around the edge of the diaphragm and increases the efficiency of projection of sound waves from its surface.

I do not limit myself to the details of construction described, as various changes may be made without departing from the invention.

What I claim is

1. In a telephone receiver, a magnet and a diaphragm sufficiently stiff to be substantially inflexible under the operating streses for which it is designed; in combination with a yielding aperiodic mounting therefor, substantially as described.

2. In a telephone receiver, a magnet and a diaphragm sufficiently stiff to be substantially inflexible under the operating stresses for which it is designed; in combination with a delicate pneumatic cushion placed against the edge of said diaphragm on the side toward said magnet, and exerting a pressure at all times light enough to permit said cushion to yield readily to the movements of the diaphragm incident to operation, substantially as described.

3. In a telephone receiver, a magnet and a diaphragm sufficiently stiff to be substantially inflexible under the operating stresses for which it is designed; in combination with a pair of delicate air cushions confining the edge of said diaphragm and pressing against the same so lightly as to permit said cushions to yield readily to the

movements of the diaphragm incident to operation, substantially as described.

4. In a telephone receiver, a magnet, a delicate air cushion, and a substantially inflexible diaphragm confined in light contact at its edge with said cushion and free of all attachment save at its edge, substantially as described.

5. In a telephone receiver, a magnet, a pair of delicate air cushions, and a substantially inflexible diaphragm confined by light pressure between said cushions at its edge and otherwise unattached, substantially as described.

6. In a telephone receiver, a substantially inflexible diaphragm, a yielding aperiodic mounting therefor, and a magnet having two poles presented on opposite sides of the center of said diaphragm, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

JESSE L. SPENCE.

Witnesses:

KATHARINE C. MEAD,
H. S. MAC KAYE.

Plaintiff's Exhibit 5.

UNITED STATES PATENT OFFICE

JESSE L. SPENCE, OF NEW YORK, N. Y., ASSIGNOR TO ELECTRICAL EXPERIMENT COMPANY, INC., A CORPORATION OF NEW YORK.

TELEPHONE-TRANSMITTER.

Specification of Letters Patent.

1,112,167. Patented Sept. 29, 1914.

Application filed June 6, 1913. Serial No. 772,087.

To all whom it may concern:

Be it known that I, JESSE L. SPENCE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephone-Transmitters, and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The principal object of the present invention is the production of a telephone transmitter capable of delivering to the transmitting medium a form of wave more strictly conforming to the acoustic wave to be reproduced than has been possible hitherto. The result is a materially improved enunciation at the receiving end of the system, which is particularly noticeable in loud speaking telephones.

One of the principal causes of distortion of sounds as finally received over a telephone is found in the fact that the transmitter diaphragms against which the speaker's voice is directed tend to impose an artificial vibratory

law upon the wave to be transmitted, either owing to the bending of the diaphragm itself or to its attachment to external devices so constructed or mounted as to have their own period of vibration. The present improvement avoids these objections by use of a substantially rigid diaphragm and a mounting for the same of an aperiodic nature, whereby neither the diaphragm itself nor any external part connected therewith tends to impose an artificial periodicity upon the resultant wave transmitted.

My improved transmitter may be used upon ordinary telephones, or in connection with wireless telephonic systems.

The accompanying drawing is a vertical section of a preferred embodiment of my invention.

Within the usual casing 10 is placed a conducting cup 11, preferably insulated from the casing where this latter is made of metal, as in the preferred form shown. This cup is connected to one out-going wire 12, while the other out-going wire 13 is connected to the diaphragm, as for instance through the casing 10 itself, as shown. Within the cap 11 is placed the carbon dust or powder, or other microphonic material 14 against which, (in my preferred form) the diaphragm 15 is made to bear directly. Owing to the fact that the diaphragm is relatively inflexible, I am able to use a thin plate of carbon in this connection, and thus get the advantage of carbon against carbon without resort to any attachments on the diaphragm. I prefer to interpose a soft felt layer 16 between the sides of the microphonic mass or masses and the cup 11. The conducting diaphragm 15 rests with its edge in contact with the metallic container or casing 10, as shown in the drawing, and is thereby brought into electrical connection with one of the leading-in wires 13. I do not confine myself to this expedient for bringing the diaphragm into the circuit, however. The proper position of the diaphragm is preserved by two delicate

annular air cushions 17 and 18, preferably of thin rubber, which make light contact with the edge of the diaphragm and act merely to support the same when not in use. I have found that cushions so used serve as an aperiodic mounting, permitting the rigid diaphragm to move without flexure in accordance with the form of the impressed acoustic wave, and without sensible distortion of such wave as reproduced, which would result where an artificial periodicity was imposed. The cushions and diaphragm are held in place by a cover 19 having the usual opening 20 and mouth piece 21.

One useful function of the air cushions is that they prevent passage of air around the edge of the diaphragm, thus diminishing loss of the energy imparted by the voice.

I have found that a transmitter constructed substantially as described causes a movement of pure translation to be imposed upon the diaphragm 15, thus bringing into uniform and efficient action all the particles or microphonic masses 14 within the cup 11. This follows from the movement of the inflexible diaphragm always parallel to the position of silence.

In certain forms of apparatus hitherto used, air cushions have been employed to clamp a diaphragm firmly in place, for damping purposes. Such a structure has no relation to the present invention, wherein a substantially rigid diaphragm is so mounted as to acquire a movement of translation as a whole. A movement of this character involves preservation of the plane form of the diaphragm at all times, and there results a more evenly distributed pressure upon the microphonic material than where the diaphragm bends in a curve. This gives better efficiency in the microphone and prevents local packing of the particles near the center, making the microphone more durable.

I do not limit myself to the details of construction described, as various changes may be made without departing from the invention.

Exhibit P-5.

What I claim is—

1. In a telephonic transmitter, a microphone, a diaphragm sufficiently stiff to be substantially inflexible under the conditions of use and mounted in operative relation with said microphone, and a resilient mounting for said diaphragm of an aperiodic character, adapted to permit movements of the diaphragm responsive to the form of acoustic waves with a minimum of distortion, substantially as described.

2. In a telephone transmitter, a microphone and a diaphragm in contact therewith sufficiently stiff to be substantially inflexible under conditions of use; in combination with a resilient aperiodic mounting for said diaphragm adapted to permit movements of translation of the same responsive to the impressed acoustic waves with a minimum of distortion.

3. In a telephonic transmitter, a conducting casing, a microphone within the same insulated therefrom, a conducting diaphragm resting on its edge upon and within said casing, said diaphragm being sufficiently stiff to be substantially inflexible under conditions of use, and a yielding aperiodic mounting for said diaphragm, substantially as described.

4. In a telephonic transmitter, a microphone, a diaphragm sufficiently stiff to be inflexible under conditions of use and mounted in operative relation with said microphone, and a pair of delicate air cushions making light contact with the opposite sides of the edge of said diaphragm and adapted to yield readily to the movements of the diaphragm incident to operation, substantially as described.

Exhibit P-9.

5. In a telephonic transmitter, a microphonic mass of carbon, a thin carbon diaphragm sufficiently stiff to be inflexible under conditions of use in contact with said mass, and a yielding aperiodic mounting for said diaphragm, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

JESSE L. SPENCE.

Witnesses:
KATHARINE C. MEAD,
H. S. MACKAYE.

Plaintiff's Exhibit 9.

AGREEMENT made this 20th day of May nineteen hundred and eighteen, between STENTOR ELECTRIC MANUFACTURING COMPANY, a corporation of New York, having its offices at Long Island City, in the City of New York, hereinafter called the Stentor Company, and KLAXON COMPANY, a corporation of Delaware, having its offices at Newark, New Jersey, WITNESSETH:—

WHEREAS the Stentor Company is the sole owner of various United States Letters Patent, and applications relating to telephone and similar apparatus, a schedule whereof is annexed hereto, marked "A" and made a part hereof; and

WHEREAS the said Stentor Company is at the present time engaged in the business of manufacturing the devices covered by said patents, and is the owner of property situated at its plant in Long Island City, including materials, stock, machinery, contracts, leases and accounts

receivable, a schedule whereof is annexed hereto, marked "B" and made a part hereof; and

WHEREAS the Klaxon Company is desirous of purchasing all of the property and assets, of every kind and nature, of the said Stentor Company, including good will, except the said patents, and is desirous of obtaining a sole and exclusive license to make, have made, use and sell the devices, methods and processes disclosed or described in the said Letters Patent;

NOW THEREFORE, in consideration of the premises, the covenants herein contained, and other valuable considerations, it is hereby agreed by and between the parties hereto as follows:

ARTICLE FIRST: The Stentor Company hereby agrees to sell, assign and transfer unto the Klaxon Company, by good and sufficient instruments of title, all of its said property and assets, including material, machinery, stock on hand, contracts, leases and accounts receivable, and all its property of every kind and nature, including its good will, except Letters Patent, domestic or foreign, and the trade name "Stentor" the ownership of which is hereby specifically reserved.

ARTICLE SECOND: The Stentor Company further agrees to grant and hereby does grant, license and transfer to the Klaxon Company for the term of this agreement, but subject to its conditions, the sole and exclusive right to make, have made, use and sell telephone and related apparatus and devices and articles made in accordance with the United States Letters Patent, and applications for patents described on Schedule "A" hereto annexed, or any subsequent improvements thereon which may be made, acquired, owned or controlled by the said Stentor Com-

pany upon the inventions or any of them, described in said Letters Patent or applications.

The Stentor Company further agrees that it will grant a similar license to manufacture the said inventions, improvements and devices under any patent which has been or which may be issued to it by any foreign state or country.

ARTICLE THIRD: The Stentor Company agrees that this license will remain in full force and effect, if not sooner cancelled or terminated as herein provided, for the term of seventeen years from September 29, 1914, except that the said Stentor Company may, at any time within two years of the expiration of the date of the above described patents, engage in the manufacture of the apparatus described therein and covered thereby; and the Stentor Company agrees that it will not, prior to said two years period, directly or indirectly engage in the manufacture or sale of articles, apparatus or improvements covered thereby, and that if within such period of two years it shall commence such manufacture its right to receive royalties hereunder shall thereupon terminate.

ARTICLE FOURTH: The Stentor Company further agrees that this sole and exclusive license shall apply to any further Letters Patent upon the same subject-matter during the life of this agreement, which may be obtained, owned or controlled by said Stentor Company.

ARTICLE FIFTH: All articles manufactured and sold by the Klaxon Company under this agreement shall bear the name "Stentor" prominently displayed thereon and on the containers in which the same are sold, for which purpose and for all purposes incidental thereto, a license to use said trade name coterminus with this agreement and any extension hereof, is hereby granted to the Klaxon Company by the Stentor Company.

Exhibit P-9.

Nothing herein contained, however, shall be deemed to restrict the right of the Klaxon Company to place and use on such articles such other trademark or trade names as it desires.

ARTICLE SIXTH: The Stentor Company further agrees that the Klaxon Company may, at its option, either itself make or grant sub-license, subject to the same conditions as this contract and extending to Stentor Company the same rights under said sub-license, to other affiliated companies and to no others, except with the consent of Stentor Company in writing, to make, use or sell devices in connection with the inventions covered hereby.

ARTICLE SEVENTH: The Stentor Company further agrees that it will indemnify and save harmless the Klaxon Company against all loss, damage and expense accruing to it by virtue of any suit for infringement or alleged infringement of any of the patents mentioned in Schedule "A" or growing out of the manufacture and sale by it or its sub-licensees of articles covered thereby, and further agrees at its sole expense to take promptly and to prosecute diligently suitable proceedings to enjoin any and all infringements of said Letters Patent or any of them, and to appear in and defend any and all suits at law or in equity, which may be brought against the Klaxon Company, its vendees, licensees and sub-licensees by reason of the manufacture, sale or use by them, or any of them of said articles or apparatus embodying said inventions, or any of them, provided, however, that prompt notice of pendency of said actions or suits shall be given by the Klaxon Company to the Stentor Company by registered mail.

ARTICLE EIGHTH: If the Stentor Company shall refuse or neglect to defend or prosecute suits for the protection

of said Letters Patent or any of them, the Klaxon Company shall have the right to prosecute and defend any and all such suits, and in so far as it may be necessary to that end, to make use of the name and Letters Patent of the Stentor Company.

ARTICLE NINTH: It is further agreed that in the event that the Stentor Company shall refuse or neglect to prosecute or defend any such suit, the Klaxon Company, before paying the Stentor Company royalties due hereunder, may deduct any cost, damage, or expense incurred by the Klaxon Company, by reason of its manufacture of the aforementioned inventions or improvements, in or in connection with any such proceeding brought by or against the Klaxon Company by reason of the negligence or refusal of the Stentor Company to protect the Klaxon Company and said Letters Patent against infringement or competition. All damages, profits, royalties or other reimbursement recovered in actions to restrain the infringement of any of the above mentioned patents shall be divided between the parties hereto in the same manner as are the net profits on manufacture as hereinafter provided.

ARTICLE TENTH: The Klaxon Company agrees that it will pay to or on account of the Stentor Company as the purchase price of all the said assets, property, other than patents, belonging to said Stentor Company, the amount of which the same are appraised by Messrs. Coats & Burchard, of Chicago, Illinois, and audited by Messrs. Haskins & Sells, said payment to be made within thirty days after the receipt by said Klaxon Company of said appraisal in writing.

ARTICLE ELEVENTH: The Klaxon Company further agrees to pay to the Stentor Company, as royalties here-

under, an amount equal to fifty per cent (50%) of the net profits realized by it from the sale of articles manufactured and sold under the patents licensed hereunder, provided, however, that if the said net profits are not equal to thirty per cent (30%) of the cost of manufacture, as herein defined, the Klaxon Company shall be entitled to retain all of said profits up to fifteen per cent (15%) of such cost of manufacture. Net profits in addition to the said thirty per cent (30%) shall be divided equally between the parties hereto. In all cases where inventions or improvements which are the subject of this agreement are incorporated with other devices or apparatus so as to form a single article, which is the subject of sale, then the wholesale selling price at which said other devices or apparatus not covered by this agreement are sold to Klaxon's other trade in general, shall be deducted from net sales price received for the complete article before determining net profits for distribution under the agreement.

ARTICLE TWELFTH: The "cost of manufacture" referred to in this agreement, shall include the actual cost of labor and material entering into the production of said articles, together with a suitable proportion of overhead and selling expenses connected therewith, and of taxes, depreciation and losses on the manufacture and sale of all devices covered by said license, and such "cost of manufacture" shall be deducted from the selling price in determining net profits.

ARTICLE THIRTEENTH: The Klaxon Company shall furnish to the Stentor Company monthly statements of all business done by the Klaxon Company affected by this contract and will use its best efforts to further the manufacture and sale of the articles covered by this agreement, and to that end it will maintain an efficient organization

for the manufacture and sale of said articles. It also agrees to maintain suitable accounts and records, to which the Stentor Company shall have access, showing the cost of manufacture and the net profits, and in the event of any difference as to the proper amount of said profits, the determination thereof shall, in the event of disagreement, within the provisions of this agreement, be made by Messrs. Haskins & Sells, certified public accountants of the City of New York, whose decision thereon shall be final and binding upon the parties hereto.

ARTICLE FOURTEENTH: Settlement of the above mentioned royalties shall be made quarterly on the tenth days of May, August, November and February.

ARTICLE FIFTEENTH: The Klaxon Company, on or before thirty days from the date of this agreement, and upon the transfer to it of the property and assets hereinbefore referred to, agrees to advance to the Stentor Company a sum, not exceeding Eighteen thousand dollars ($18,000.), equal to the amount by which the accounts outstanding against the Stentor Company exceeds the amount of its property, assets and accounts receivable as determined above, which said amount, with interest at the rate of six per cent. (6%), the Stentor Company agrees shall be repaid to the Klaxon Company by the retention of royalties due to the Stentor Company pursuant to this agreement up to the said amount advanced, with interest.

ARTICLE SIXTEENTH: In the event that a Receiver in bankruptcy proceedings shall be appointed for the Klaxon Company or that it shall be adjudicated a bankrupt, this agreement shall, at the option of the Stentor Company, be subject to cancellation upon thirty days notice in writing.

Exhibit P-9.

ARTICLE SEVENTEENTH: In the event that either of the hereinafter described patents, Nos. 1,112,392 and 1,112,167 is declared invalid or substantially limited in scope by the decree by any court of competent jurisdiction, or when by reason of obsolescence of the articles covered by said patents, a net profit of fifteen (15%) per cent cannot be secured by the Klaxon Company, it shall have the right, upon thirty days written notice by registered mail to the Stentor Company, to cancel this contract and any rights herein granted shall, upon the date said cancellation becomes effective, cease and determine and shall revert to the Stentor Company free and clear from any claim on behalf of the Klaxon Company as if this agreement had not been made.

ARTICLE EIGHTEENTH: The minimum price of all articles to be manufactured and sold under this contract shall be fixed by the Klaxon Company, except that in the event that the sales price shall not return a profit on the cost of manufacture as heretofore defined equal to thirty per centum (30%) of said cost, the minimum sales price shall be fixed by subsequent agreement or agreements between the parties.

ARTICLE NINETEENTH: This agreement is on the express condition that Stentor Company will obtain a contract from J. L. Spence by which the latter will agree to enter the employ of Klaxon Company for a period of one year and to devote all of his time to the development and the manufacture of the articles and devices covered by this agreement at a salary of Five thousand two hundred ($5200.) Dollars per year, which contract will at the election of the Klaxon Company be extended for a further period of three years.

ARTICLE TWENTIETH: It is further agreed that upon the expiration of the above mentioned patents, the Klaxon Company shall, except in the event that the Sten-

tor Company itself shall commence manufacturing, have the exclusive right to continue to make, have made, use and sell articles covered by other patents enumerated in Schedule "A", or any other patents that may hereafter be granted to or owned or controlled by the Stentor Company, and shall have such exclusive right upon such terms as are agreed upon by the parties, or, in the absence of such agreement, upon the terms of the most favorable offer made *bona fide* to the Stentor Company by third parties.

ARTICLE TWENTY-FIRST: This agreement shall bind and benefit the parties hereto, their successors and assigns, but no assignment of the rights granted hereunder is authorized, except as set forth in ARTICLE SIXTH hereof, without the written consent of the other first had and obtained, provided, however, that it is distinctly understood and agreed that a new corporation may be formed to take over the rights to be acquired and which will assume the obligations contained in this instrument to be performed by the Stentor Company, and to hold the patents and applications for Letters Patent herein mentioned and to such new corporation the Klaxon Company hereby expressly consents that this agreement may be assigned, transferred and set over by the Stentor Company.

ARTICLE TWENTY-SECOND: During the term of this agreement and any extension hereof, the Klaxon Company agrees not to itself manufacture or sell, nor manufacture or sell for any other party, any article, device or apparatus which would be competitive with or a substitue for any article, device or apparatus covered by this agreement without the written consent of the Stentor Company first had and obtained.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their respective Presidents, and their corporate seals to be hereunto affixed,

Exhibit P-9.

attested by their respective Secretaries, the day and year first above written.

STENTOR ELECTRIC MANUFACTURING COMPANY,

By BUELL HOLLISTER
President.

Attest:
C. E. DANFORTH
Secretary.

KLAXON COMPANY
By D. A. W. CORNELL
President.

Attest:
WALTER P. COGHLAN
Secretary.

SCHEDULE "A".

Patents.

U. S. Patent No. 1,112,392—Telephone Receiver, issued September 29th, 1914.

U. S. Patent No. 1,112,167—Telephone Transmitter, issued September 29th, 1914.

U. S. Patent No. 1,235,851—Improved Helmet for Aviators, issued August 7th, 1917.

U. S. Patent No. 1,235,853—Electric Cigar Lighter, issued August 7th, 1917.

Patent Applications Pending.

U. S. Serial No. 830,108—Telephone Transmitter; Claim rejected August 16th, 1917.

U. S. Serial No. 158,538—Telegraphic System; Application rejected July 20th, 1917.

U. S. Serial No. 193,227—Telephonic System of Distribution; Rejected January 28th, 1918.

Dated, May 1918.

Exhibit P-9.

SCHEDULE "B".

1. Lease of Building, 68 Hunters Point Avenue, Long Island City, New York, for 2 years, beginning January 1st, 1918, at $5,000 per year.

2. Important Contracts for Products:

U. S. Contract No. 34145	$109,080.00
" " No. 2045	21,000.00
" " No. 33199	47,400.00
" " No. 1029	2,737.00
" " No. 33410	15,800.00
Req. AF-631— (Union Iron Wks.)	4,240.00
" AF-632— (Fore River Wks.)	3,392.00
" AF-635— (" " ")	776.00
" 11-H-1055 (Bath Iron Wks.)	1,690.00
" 11-H-1054 (" " ")	1,690.00
" H-228-247-614 (Newport News Shipbuilding Corp.)	33,920.00
	241,725.00

3. Inventory.

Tools and machinery in building at 68 Hunters Point Avenue, Long Island City, New York, as follows:

Finished autophone Sets Complete and in stock, approximately	$ 3,000.00
Autophone Set parts, Active Material approximately	13,000.00
Receivers, Transmitters and parts of same for Ship Sets and Railroad Sets, etc., Active Stock, approximately	7,000.00

Exhibit P-38.

Ship Set parts, Active Stock, approximately	2,500.00
Miscellaneous parts, common to all classes of finished products, approximately	2,000.00
TOTAL	$27,500.00
Tools and Machinery	6,200.00
Accounts Receivable	31,160.00
Goods in Process	25,000.00

Plaintiff's Exhibit 38.

C. E. Wilson — General Manager
L. O. Parker — Engineering

July 27, 1926

Referring to Ralph Smith's letter of March 6th, in regard to stentor equipment for Fisher Body, this business is going along very smoothly at the present time. We are having very little trouble in assembling and getting enough parts to fill all orders promptly. Under the circumstances, I believe that inasmuch as we are actually showing a fairly good profit on this business and enough to pay the Stentor Company something on their contract that it would be advisable for us to reduce the price of the equipment to Fisher Body enough to bring the profit down to a point where it would not be necessary to pay any to this outside concern.

Mr. Cooper has promised to investigate this matter and notify me just what reduction could be made on the Fisher Body business to bring it down to the point where we would only be making our own legitimate profit and not be obliged to pay any out to the Stentor Corporation.

Exhibit P-41.

The last cost figure I received from the Cost Department on this equipment is $9.89 while we are at present charging them $14.87 per set.

Mr. Cooper has told me that the amount of total sales last year was approximately $41,000.00 while the net profit was $8,675.00.

LOP:EKW
Copy to: B. W. Cooper

Plaintiff's Exhibit 41.

B. W. Cooper, Resident Comptroller.

December 19, 1929.

Mr. C. R. Carroll, Legal Dept.,
General Motors Corporation,
New York, N. Y.

I am enclosing Stentor statement in duplicate for the quarter ending September 30th, together with our check to pay the Stentor portion.

The occasion for some profit in this particular quarter was that we sold a small amount of equipment to some outside Companies, including Studebaker, Franklin and Kissell.

With further reference to your letter of October 3rd, Mr. Kroeger has not yet arranged to terminate our Stentor business with the Studebaker Corporation and as a result is not yet willing to adyise the Stentor Company that we wish to cancel the contract.

B. W. COOPER,
Resident Comptroller.

BWC(S
Encl.

Plaintiff's Exhibit 42.

DELCO-REMY CORPORATION

INTER-ORGANIZATION LETTERS ONLY

DATE May 10, 1928.

SUBJECT Stentor Autophone equipment
FROM Wm. O. Nelson
FOR ATTENTION OF Engineering Department.

I am attaching a copy of temporary sales price lists which I have completed for Fisher Body and Fleetwood with the new selling prices which I wish you would check over carefully and supply me with whatever information you may have, which I have not included on these lists.

I have been unable to complete in all cases the information at the top of the sheet referring to the car model on which the equipment is used. I have been unable to complete the designation for transmitters, receivers and horns in all cases. I would appreciate receiving these back from you as soon as possible with corrections you have to suggest.

WM. O. NELSON.

WON:GTD

Exhibit P-42.

May 1, 1928.

DELCO REMY CORPORATION

Sales Price List

Stentor Autophone

Fisher Body Corporation, Plant #38, Detroit, Mich.
Models ?

Terms: Net 25th Prox. F. O. B. Point of Shipment

Name	Delco Remy No.	Customer's No.	Unit Price	Total
1 Transmitter	822673		4.25	4.25
1 Receiver B-3	814659		2.25	2.25
1 Reel—Gray Cord	814661	29722-3	1.50	1.50
1 Horn A-6	814649	50795	2.25	2.25
1 Dome Plate	814819		.25	.25
1 Cover Plate	814820		.25	.25
Complete Set	825174	50830-CH		$10.75

Special Butler Finish Transmitter

New prices effective May 1, 1928.

Exhibit P-42.

May 1, 1928.

DELCO REMY CORPORATION

Sales Price List

Stentor Autophone

Fisher Body Corporation, Plant #38, Detroit, Mich.
Model: Cadillac

Terms: Net 25th Prox. F. O. B. Point of Shipment

Name	Delco Remy No.	Customer's No.	Unit Price	Total
1 Transmitter	822984		4.25	4.25
1 Receiver B-3	814659		2.25	2.25
1 Reel—Gray Cord	814661	29722-3	1.50	1.50
1 Horn A-6	814649	50795	2.25	2.25
1 Dome Plate	814819		.25	.25
1 Cover Plate	814820		.25	.25
Complete Set	825175	50830-AM		$10.75

New prices effective May 1, 1928.

Exhibit P-42.

May 1, 1928.

DELCO REMY CORPORATION

Sales Price List

STENTOR AUTOPHONE

FLEETWOOD BODY CORPORATION, Reading, Pa. MODEL ?

TERMS: Net 25th Prox. F. O. B. Point of Shipment

Name	Delco Remy No.	Customer's No.	Unit Price	Total
1 TRANSMITTER N-NF	814654	5713	4.25	4.25
1 RECEIVER	814658	5712	2.50	2.50
1 HORN	814646	5714	2.50	2.50
1 REEL—Gray Cord	814661	5715	1.50	1.50
COMPLETE SET	825172			$10.75

New prices effective May 1, 1928.

Exhibit P-42.

May 1, 1928.

DELCO REMY CORPORATION

Sales Price List

STENTOR AUTOPHONE

FISHER BODY CORPORATION, Plant #1, Detroit, Michigan.
MODEL: LaSalle Imperial Sedan

TERMS: Net 25th Prox. F. O. B. Point of Shipment

Name	Delco Remy No.	Customer's No.	Unit Price	Total
1 TRANSMITTER BN-NC	816428	50796-M	4.25	4.25
1 RECEIVER B-3	814659		2.25	2.25
1 REEL—Gray Cord	814661	29722-3	1.50	1.50
1 HORN A-6	814649	50795	2.25	2.25
1 DOME PLATE	814819		.25	.25
1 COVER PLATE	814820		.25	.25
COMPLETE SET	825173	50830-CM		$10.75

New prices effective May 1, 1928.

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STATEMENT OF

	5-20-18 to 12-31-18				
	1918	1919	1920	1921	1922
Net Sales	163,515.12	154,816.39	93,340.22	62,696.13	92,569.79
Total Cost of Manufacture	102,085.12	147,782.94	97,802.45	63,937.62	73,451.94
Profit	61,430.00	7,033.45	[4,462.23	1,241.49]	19,117.85
15% of Cost of Manufacture	15,312.77	22,167.44	14,670.36	9,590.64	11,017.79
Credit to Klaxon Company	30,715.00	7,033.45	[4,462.23	1,241.49]	11,017.79
Credit to Stentor	30,715.00	-0-	-0-	-0-	8,100.06
Debits to Stentor or Cash remitted	30,716.00	-0-	-0-	-0-	8,100.06

These [

aintiff's Exhibit 44.

F INCOME FROM OPERATIONS
Klaxon Company
Stentor Division

1923	1924	1925	1926	1927	1928	1929	1930	Total
102,418.10	42,212.81	41,103.15	48,876.98	60,858.28	67,742.41	23,030.03	2,436.75	955,616.16
67,704.98	48,756.74	33,837.38	35,693.62	49,799.90	59,926.12	20,307.92	2,211.43	803,298.16
34,713.12	[6,543.93]	7,265.77	13,183.36	11,058.38	7,816.29	2,722.11	225.32	152,318.00
10,155.75	7,313.52	5,075.61	5,354.04	7,469.99	8,988.92	3,046.19	331.71	120,494.73
17,356.56	[6,543.93]	5,075.61	6,591.68	7,469.99	7,816.29	2,722.11	225.32	83,776.15
17,356.56	-0-	2,190.16	6,591.68	3,588.39	-0-	-0-	-0-	68,541.85
17,356.56				12,370.23	1,824.15	351.08		70,718.08

] indicate Red Figures

Plaintiff's Exhibit 50.

TABLE 10.—RADIO APPARATUS AND TUBES—PRODUCTION, BY KIND, NUMBER, AND VALUE: 1921 TO 1927

[See Table 3, p. 1055]

	1927	1925	1923	1921
Total value	[1]$198,436,434	[1]$178,834,697	[1]$54,000,470	$10,647,617
Radio apparatus, total value	$176,273,332	$155,819,724	$44,176,298	$9,549,669
Loud speakers—				
Number	2,458,785	2,844,652	623,146	
Value	$18,838,751	$18,955,916	$5,608,330	
Head sets—				
Number	267,730	1,352,442	1,781,793	
Value	$319,173	$2,164,529	$5,345,380	
Receiving sets[2]—				
4-tube and smaller—				
Number	34,392			
Value	$671,690	2,395,790	190,374	
5-tube and larger—		$93,356,546	$13,326,116	
Number	1,943,665			
Value	$94,490,703			
Transmitting sets—				([3])
Number	1,093	1,076	1,082	
Value	$2,233,483	$1,355,768	$919,930	
Transformers—				
Number	4,116,046	5,295,507	1,571,817	
Value	$5,447,403	$7,614,774	$3,929,581	
Rheostats—				
Number	3,459,240	3,562,543		
Value	$1,420,780	$2,018,592		
Socket-power devices—				
Number	1,406,129		$15,046,961	
Value	$23,334,048	$30,353,599		
Miscellaneous parts, value	$29,517,301			
Radio tubes, total value	$22,163,102	$23,014,973	$9,824,172	$1,097,948
Under 5 watts—				
Number	23,650,733	23,444,035		
Value	$17,481,296	$20,528,850	4,687,400	101,968
Other—			$9,824,172	$1,097,948
Number	2,686,512	622,153		
Value	$4,681,806	$2,486,123		

[1] This total is the sum of the value items in the column below, except that underscored.

[2] Not including combination phonographs and radios, which are classified for census purposes in the "Phonographs" industry.

[3] Not reported separately.

Plaintiff's Exhibit 51.

ELECTRICAL MACHINERY, APPARATUS, AND SUPPLIES.

951

Ohio led all states in the production of storage batteries, followed by Pennsylvania, New York, New Jersey, and Indiana, in the order named. The value of battery supplies and parts—storage and primary—increased from $3,265,616 in 1914 to $6,985,780 in 1919, equivalent to 113.9 per cent.

INCANDESCENT LAMPS.—Statistics for incandescent lamps are given in Table 17 for 1919, 1914, and 1909. Statistics for 1919 show an increase in value over that for 1914 of $40,296,515, or 232.3 per cent. The tungsten type formed 80.9 per cent of the value of all incandescent lamps manufactured in 1919 and 68.5 per cent in 1914. The gem type was included with vacuum and vapor lamps to avoid a disclosure of individual operations.

TABLE 17.—INCANDESCENT LAMPS: 1919, 1914, AND 1909.

Kind	1919	1914	1909
Total value	$57,646,900	$17,350,385	$15,714,809

Exhibit P-51.

TABLE 19.—TELEPHONE APPARATUS: 1919, 1914, AND 1909.

Class	1919	1914	1909
Total value	$46,214,342	$22,815,640	$14,259,357
Central switchboards:			
Manual—			
Central battery—			
Number	1,330		
Value	$6,500,560	$10,701,764)	
Magneto—		)	
Number	4,594	....)	
Value	$1,344,404	$374,851)	
Automatic, value	$4,327,516	$1,002,722)	
Substation instruments:			
Central battery—			
Number	642,093	641,082)	$10,137,534
Value	$3,839,978	$3,916,869)	
Magneto—			
Number	280,502	216,879)	
Value	$3,276,604	$1,799,834)	
Interior systems:			
Number	173,799	62,258)	
Value	$1,578,778	$510,509)	
Private branch exchange switchboards:			
Number	6,880	3,693	2,252
Value	$2,287,122	$448,203	$369,915
Parts and supplies, value	$23,059,380	$4,060,888	$3,751,908

HOUSEHOLD AND INDUSTRIAL APPARATUS.—The most remarkable development in the entire industry appears in household and industrial apparatus and devices.

Plaintiff's Exhibit 52.

1058

CENSUS OF MANUFACTURES: 1927

TABLE 6.—TELEPHONE, TELEGRAPH, AND FIRE-ALARM APPARATUS—PRODUCTION, BY VALUE: 1921 TO 1927

[See Table 3, p. 1055]

	1927	1925	1923	1921
Total value	[1]$124,624,190	[1]$87,922,490	[1]$97,123,804	[1]$104,640,578
Telephone apparatus, total value	$115,451,822	$81,510,499	$92,398,031	$101,992,354
Switchboards, central-office and private-branch exchange, value	$68,669,904	$42,463,527	$50,552,822	$63,785,122
Substation instruments—				
Number	2,574,055	2,458,730	)	
Value	$21,158,295	$18,401,666	3,249,802)	
			$22,748,623)	$38,207,232
Interior systems, value	$3,351,074	$4,433,383)		
Parts for telephone apparatus, value	$22,272,549	$16,211,923)	$19,096,586)	
Telegraph apparatus (not including wireless):				
Keys, sounders, and relays, all types, value	$516,904	$519,040)		
Other wire-telegraph apparatus, value	$5,044,458	$2,403,123)	$2,085,854	[2]$244,069
Fire-alarm apparatus, value	$3,611,006	$3,489,828	$2,639,919	$2,404,155

[1] This total is the sum of the value items in the column beneath, not including underscored totals.

[2] Not comparable with figures for later years because of changes in classification.

TABLE 7.—MOTORS (NOT INCLUDING CONTROLLERS[1] OR AUTOMOTIVE STARTER-MOTORS[2]), MOTOR PARTS AND SUPPLIES, AND ELECTRIC FANS—PRODUCTION, BY NUMBER AND VALUE: 1921 TO 1927

Plaintiff's Exhibit 57.

March 2, 1918

Alfred P. Sloan, Jr. Esq.
United Motors Corporation,
29 W. 42nd St.,
City.

Dear Mr. Sloan:—

I am enclosing memorandum of an agreement between your company and the Stentor Electric Manufacturing Co., agreeing with your proportion of percentage of profits, with the exception of all the Navy business. We have worked very hard for this for four years, and have succeeded in having our instruments made Navy standard, with the result that the orders come to us now without solicitation or selling.

A clause allowing us to sell out our company to a new company was inserted, for our present capitalization of $10,000 is much too small under present conditions.

Our present debt amounts to about $95,000, less about $13,000 owing to us by the Government, and $30,000 of goods 65% completed, according to Government inspection reports. We have also material on hand amounting to about $15,000 and machinery and tools, about $5,000 more.

We trust that if these conditions as a whole are agreeable to you, that plans can be made at once to increase our manufacturing facilities, as the sooner the contracts now on hand are completed, the larger the additional amounts we will receive.

The auto phone business should also be sought with as little delay as possible.

Thanking you for all your courtesies in the matter, I am

Very truly yours,

BUELL HOLLISTER.

Plaintiff's Exhibit 70.

Anderson, Indiana

September 18, 1929

B. W. Cooper, Resident Comptroller.

Mr. Charles R. Carroll, Legal Department,
General Motors Corporation,
Broadway at 57th Street,
New York, N. Y.

I am enclosing Stentor Statements in duplicate for the quarter ending June 30th, 1929.

I wish to suggest that as specified in the contract you notify the Stentor Company that it is no longer possible for us to price and sell Stentor equipment so that it will yield a profit to the Stentor Company. We have lost all of the business with the Fisher Body Company and have nothing left except a few miscellaneous small accounts and some new business with Studebaker Corporation. In order to get this business it was necessary to price the equipment very low. In order to be on the safe side I believe the Stentor Company should be notified of this condition.

B. W. COOPER,
Resident Comptroller.

BWC:BS
Encl.

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Plaintiff's Exhibit 79.

WHITELAND MANUFACTURING CORPORATION
1600 Chestnut Avenue Brooklyn, N. Y.

May 14th, 1923

Mr. Buell Hollister
20 Exchange Place
New York

Dear Mr. Hollister:—

I am sure that no one interested in the agreement between the Stentor Co. and the Gen. Motors, would willingly work a hardship on myself, as the original owner of the patents, but such a condition has I think developed.

I have tried to interest both sides in radio as a more extensive field, without success,—and now I wonder if it would not be possible for me to obtain the rights to use the patents for purposes other than automobile telephone sets particularly radio, so that I may have the chance at least to do something further with the patents before the rights expire.

This may appeal to everyone as a fair thing to do, as no one else is interested, and I should like to make this request, through you if you are agreeable, and if you feel that it can be arranged without injury to our interests in the agreement with the Genl. Motors.

I wish you would let me know what you think of the suggestion.

Very truly yours,

J. L. SPENCE.

Plaintiff's Exhibit 96.

REPORT

ON

PATENT PROTECTION

under

KLAXON-STENTOR-SPENCE LICENSE AGREEMENT

of

MAY 20, 1918.

This report does not cover novelty or validity of the Spence patents and applications, nor possible infringement of patents of third parties by the various Stentor products. It covers only the question of whether the Spence patents and applications afford any patent protection for the Stentor products.

The report is based on a careful examination of the Klaxon-Stentor license agreement; the patents and applications covered thereby; a personal inspection of the more important types of apparatus; various personal interviews with Mr. Farmer and others; written reports in Mr. Berg's files; and the written reports which Mr. Berg and Mr. Farmer recently made to you. While I have not collected all of the original documents nor examined all of the witnesses nor established all of the dates and facts, there is little doubt but that, in a broad way and substantially, they are as follows:

The agreement of May 20th, 1918 gives the Klaxon Company an exclusive license under the patents and applications mentioned in Schedule A annexed thereto and

also under future patents and applications. It requires payment of royalty on

> "the net profits realized by it from the sale of articles manufactured and sold under the patents licensed hereunder".

It forbids Klaxon to make or sell

> "any article, device or apparatus which would be competitive with or a substitute for any article or device covered by this agreement".

Four patents and four applications are mentioned in Schedule A and five more have been filed since that time, but so far as I can find, neither the products manufactured by the Klaxon Company since May 20th, nor by the Stentor Company before that date, are covered by any of these patents or applications.

TELEPHONE TRANSMITTER: Spence patent No. 1,112,167, granted September 29th, 1914. This patent is directed to a transmitter diaphragm and its mounting.

The invention is described by the patents as follows:

> "The proper position of the diaphragm is preserved by *two delicate annular air* cushions 17 and 18, preferably of *thin rubber,* which make *light contact* with the edge of the diaphragm and act merely to support the same when not in use. I have found that cushions so used serve as an aperiodic mounting, permitting the rigid diaphragm to move *without flexure* in accordance with the form of the impressed acoustic wave."
>
> "In certain forms of apparatus hitherto used, air cushions have been employed to clamp a diaphragm firmly in place, for damping purposes.

Such a structure has no relation to the present invention, wherein a substantially rigid diaphragm is so mounted as to acquire a movement of translation as a whole."

This may possibly justify the following claims.

4. In a telephonic transmitter, a microphone, a diaphragm sufficiently stiff to be inflexible under conditions of air and mounted in operative relation with said microphone, and a pair of *delicate air cushions* making *light contact* with the opposite sides of the edge of said diaphragm and adapted to yield readily to the movements of the diaphragm incident to operation, substantially as described.

1. In a telephonic transmitter, a microphone, a diaphragm *sufficiently stiff to be substantially inflexible* under the conditions of air and mounted in operative relation with said microphone, and a resilient mounting for said diaphragm of an aperiodic character, adapted to permit movements of the diaphragm responsive to the form of acoustic waves with a minimum of distortion, substantially as described.

In the patent the air cushions are seamless, endless rubber tubes containing air but this is not Spence's invention as will be evident from the above quoted statement that "in certain forms of apparatus hitherto used, air cushions have been employed to clamp a diaphragm *firmly*". This is true. The seamless, endless rubber tubes enclosing air are shown in prior patents

Nussbaum, No. 1,069,899, patented August 12th, 1913, for a telephone transmitter;

Stenart, No. 910,244, January 14th, 1909, for telephone receiver; and

Exhibit P-96.

British patent No. 21,812, October 3rd, 1911, for telephone transmitters and receivers.

Spence's claims were rejected on these patents, and his present claims were allowed solely on his emphatic representations that his air cushions were extremely delicate, that the diaphragm made very light contact therewith, and that his diaphragm was inflexibly rigid and moved like a piston.

For present purposes we will assume that Spence did have such an invention and that his claims are valid. The same state of facts applies to the receiver patent.

TELEPHONE RECEIVER: Spence patent No. 1,112,392, granted September 29th, 1914. This patent is directed to a receiver diaphragm and its mounting.

The invention is described by the patentee as follows:

"It will be seen that my improved receiver comprises a diaphragm, mounting-cushions and magnet so constructed and proportioned, as to magnet strength, diaphragm thickness and *delicacy of air cushion mounting*, that the diaphragm has a practically aperiodic action under the expected conditions of use."

"I have found that, where a relatively rigid diaphragm is lightly enough confined against a *pneumatic cushion* at its edge, this cushion exerts an aperiodic resilience, which leaves the diaphragm free to conform its movements as a whole to the particular vibrations which correspond to the magnetic changes in the telephone receiver. Such a cushion acts merely to hold up the diaphragm when current is cut off, and to preserve its proper angular position with respect to the magnet at all times."

Exhibit P-96.

A diaphragm sufficiently "rigid" supported on a "pneumatic cushion" sufficiently delicate and held there "lightly enough" may possibly justify the claims of which the following is an example.

> 4. In a telephone receiver, a magnet, a *delicate air cushion,* and a substantially inflexible diaphragm confined in light contact at its edge with said cushion and free of all attachment save at its edge, substantially as described.
>
> 1. In a telephone receiver, a magnet and diaphragm *sufficiently stiff to be substantially inflexible* under the operating stresses for which it is designed; in combination with a *yielding aperiodic* mounting therefor, substantially as described.

Possibly Mr. Spence may at some time have made a telephone receiver embodying this invention, but no one having anything to do with the manufacturing business seems to have any knowledge of any such apparatus. The diaphragm now used is an ordinary flexible diaphragm such as is commonly used in telephone receivers. It is not lightly confined against a delicate air cushion but is tightly clamped between rubber gaskets made from small size rubber tubes cut to length and left open at the ends so that air cushion effect is absolutely impossible. Moreover, the tubing, though necessarily small, has relatively thick walls and they clamp the diaphragm tightly enough to flatten the tubes forming a water-tight joint, and hold the diaphragm in a very accurately fixed position which must be close to but out of contact with the poles of the receiving magnet and which must be maintained throughout the life of the instrument notwithstanding the continuous powerful pull of the magnet.

In practice, however, your people find that these open ended rubber tubes even when screwed down flat are

very unsatisfactory for quantity production. The tubing is not of sufficiently uniform diameter or are the walls of sufficiently uniform thickness to give consistent results and much skill and experience is required to make the experimental adjustments and tests necessary to get the good results.

Moreover, tube gaskets even when skillfully and perfectly adjusted give no better results than other forms of clamping. As a result, experiments are still being conducted to determine the best form of non-tubular gasket. In one notable instance at least, Spence himself got entirely satisfactory results by clamping the diaphragm between brass wire rings. This was in the transmitters in the sets tested and approved by the Navy. Mr. Farmer tells me that the brass rings were screwed so tight against the diaphragm that when the instruments were taken apart, the outer edge beyond the ring broke away from the central part inside of the ring. Moreover in the receivers in which did use open end rubber tube gaskets, they were squeezed down very tightly to bring the diaphragm in proper spacing with respect to the poles of the receiver magnet. In other words Spence himself did not use an air cushion, did not lightly support the diaphragm thereon and did not use a rigid diaphragm. He did sometimes use the open ended tube as a tightly clamped gasket, but got good results with a plain brass wire ring having no cushion quality of any kind.

The Spence transmitter and receiver patents do not cover any devices Stentor was making when it sold out to you on May 20th. Furthermore, the apparatus made at that time was not standardized nor satisfactory for quantity production. Furthermore, it was at best in an experimental, transitory stage leading further and further away from the Spence patents and your development work necessarily follows farther along the same diverging path.

Exhibit P-96.

WIRING SYSTEMS: Wiring systems are not marketed products. They are schemes for wiring up the sets at the various places where they are used. All your uses are so simple that patent protection seems impossible, particularly in an art like this which has been actively developed for more than thirty years. Spence has applications for various wiring systems, some of them relating to telegraphy and not telephony and I believe none of them afford any protection. They include Serial Nos. 241,930, filed June 26th, 1918; 244,141, filed July 10th, 1918; 241,931, filed June 26th, 1918; 193,227, filed September 26th, 1917; and 158,538, filed March 30th, 1917. The latter is for a telegraph system.

TRANSMITTER AND RECEIVER SET: Spence application Serial No. 276,920, filed February 14th, 1919, division of application Serial No. 241,931, filed June 26th, 1918. Both of these applications have been filed since the agreement of May 20th, 1918. The device is substantially anticipated in British patent to Siemens No. 467 of January 7th, 1910. Mr. MacKaye in telephone conversation admitted this. He told me that he had overlooked the patent referred to or he would not have filed a divisional application therefor.

Mr. Farmer tells me that when the sets were constructed as shown in the application, they howled and that he had to adopt a new arrangement to prevent this.

The feature of a drain hole which is mentioned in one of the claims is anticipated by Hutchison's first electric horn patent which is owned by the Klaxon Company.

CONCLUSIONS.

My conclusions are that your Klaxon—Stentor products are not covered or protected by any existing patents or applications of Spence; that Spence made no inventions

capable of supporting any applications or patents that will protect you; and finally that Spence having left the Company, any possible patent protection can come only from inventions made by Mr. Farmer or other employees of the Klaxon Company who are conducting the development work.

New York, N. Y. April 26th, 1919.

Plaintiff's Exhibit 111.

January 20th, 1919.

Hon. Commissioner of Patents,
United States Patent Office,
Washington, D. C.

Sir:

Please permit George C. Dean, or his duly authorized representative to inspect and obtain copies of the file wrapper, contents and drawings of the application to Spence, No. 158,538, Telegraphic System.

Respectfully,

JESSE L. SPENCE

Hon. Commissioner of Patents,
United States Patent Office,
Washington, D. C.

Sir:

Please permit C. A. Longfellow to inspect and obtain copies of the file wrapper, contents and drawings in the above application.

Respectfully,

Plaintiff's Exhibit 136.

State of New York,
Department of State—ss.:

I HEREBY CERTIFY, That I have made diligent examination of the index of corporation certificates filed in this department for a Certificate of Incorporation of

STENTOR ELECTRIC COMPANY, INC.,

and that upon such examination, I find no such Certificate of Incorporation on file in this department.

WITNESS my hand and the official seal of the Department of State at the City of Albany, this sixth day of July, one thousand nine hundred and thirty-nine.

FRANK S. SHAYS,
Deputy Secretary of State

Plaintiff's Exhibit 137.

CERTIFICATE OF DISSOLUTION

of

STENTOR ELECTRIC COMPANY, INC.

STATE OF NEW YORK
Office of
SECRETARY OF STATE
FILED JAN 7 1919

FRANCIS M. HUGO
SECRETARY OF STATE

CERTIFICATE FOR DISSOLUTION

of the

STENTOR ELECTRIC COMPANY, INC.

WE, the undersigned, Buell Hollister, President, and C. E. Danforth, Secretary of the STENTOR ELECTRIC COMPANY, INC., a stock corporation organized under the laws of the State of New York, do hereby, for the purpose of complying with the provisions of section 221 of the General Corporation Law of the State of New York in relation to the voluntary dissolution of corporations, make and attest this certificate and attach thereto the consent, verified statement and waiver of notices as required by statute, as follows, to wit:

That the Board of Directors of said corporation, at a meeting called for that purpose and held at the offices of Messrs. Nicoll, Anable, Lindsay & Fuller, No. 61 Broadway, Borough of Manhattan, City of New York, on the 12th day of November, 1918, at 11:15 o'clock in the forenoon, notice of which meeting was duly waived by each and all of the directors as appears by their

Exhibit P-137.

original waiver in writing hereto annexed and formi
a part hereof, did, by the unanimous vote of the wh
board adopt the following resolutions:

RESOLVED, That in the opinion of this Board
Directors, it is advisable to dissolve this corpor
tion forthwith in the manner prescribed by secti
221 of the General Corporation Law of the Sta
of New York, and that a meeting of the sto
holders be held at the offices of Messrs. Nic
Anable, Lindsay & Fuller, No. 61 Broadway,
the Borough of Manhattan, City of New Yo
on the 12th day of November, 1918, at 11:30 o'clo
in the forenoon, for the purpose of voting on
proposition that the corporation be dissolved fort
with, pursuant to waivers of notice of such me
ing, fixing the time and place thereof, signed
all the stockholders of the Company, as authoriz
by section 42 of the General Corporation La
and further

RESOLVED, That unless notice of such meeti
be waived by all the stockholders, the Secreta
cause notice of such meeting to be held at t
offices above-mentioned on the 20th day of D
cember, 1918, at 2:30 o'clock in the afternoon,
be both published and served as prescribed by la
and further

RESOLVED, That the President and Secreta
execute a certificate showing the adoption of th
resolutions and setting forth the proceedings
the said meeting of stockholders, and that th
also attest the written consent of the stockhold
that the corporation be dissolved, and execute a
verify all statements required by law to disso
the said corporation, pursuant to the provisi

of section 221 of the General Corporation Law of the State of New York; and further

RESOLVED, That the President and the Secretary cause such certificate and consent to be filed in the office of the Secretary of State, together with a duly verified statement of the names and residences of the members of the existing Board of Directors and of the names and addresses of the officers of this corporation, and proof of publication and all certificates and waivers of all notices prescribed by law; and that the officers and Directors of the corporation take such further action as may be required to effect the dissolution of the corporation and wind up its business and affairs pursuant to the provisions of section 221 of the General Corporation Law of the State of New York.

That notice of a meeting of the stockholders of said corporation, for the purpose of voting upon a proposition that the said corporation be dissolved forthwith, was duly waived in writing by the holders and owners of all of the shares of stock of the said corporation then issued and outstanding, who also consented in writing that the said meeting be held on the 12th day of November, 1918, at 11:30 o'clock in the forenoon, at the offices of Messrs. Nicoll, Anable, Lindsay & Fuller, No. 61 Broadway, in the Borough of Manhattan, County of New York, City of New York, being the Borough, City and County where the last preceding annual meeting of the corporation was held, as appears by the original consent and waiver in writing hereto annexed and forming a part hereof.

That pursuant to such consent and waiver, a meeting of the stockholders of the said corporation was held on

the 12th day of November, 1918, at 11:30 o'clock in the forenoon, at said office, and that at such meeting the holders of more than two-thirds in amount of the stock of the said corporation then issued and outstanding, to wit, the holders of 1,000 shares of stock, being the total amount of stock issued and outstanding, appeared in person and organized the meeting by choosing Buell Hollister as chairman, and C. E. Danforth as secretary of the said meeting; and thereupon the said waiver of the notice of the meeting and consent of the stockholders and the resolutions adopted by the Board of Directors, hereinbefore set forth, were presented and read to the meeting; and thereupon the following resolution was adopted by the affirmative vote of the holders of 1000 shares of the stock of the corporation, being the total amount of stock issued and outstanding, to wit:

> RESOLVED, That the resolutions of the Board of Directors, adopted at the meeting of the Board held on the 12th day of November, 1918, at 11:15 o'clock in the forenoon, in favor of the immediate dissolution of this Company, be and are hereby approved, and that the holders of 1000 shares of the capital stock of the Stentor Electric Company, Inc., hereby consent that the said corporation be dissolved forthwith, pursuant to the provisions of section 221 of the General Corporation Law of the State of New York, and that the officers and directors of the Company be and are hereby authorized to take all necessary and proper action to effectuate such dissolution and to wind up the business and affairs of the Company, and that we hereby signify our consent in writing to such dissolution, in conformity with the provisions of said statute.

That the votes of the holders of 1000 shares of the stock of said corporation then issued and outstanding,

being the entire number of shares of stock issued and outstanding, were cast in favor of such resolutions and the said resolutions were declared duly adopted.

Thereupon, at said meeting, the owners and holders of more than two-thirds in amount of the stock of said corporation then issued and outstanding, to wit, the holders of 1000 shares, being the entire amount of said stock issued and outstanding, did signify their consent in writing that such corporation be dissolved forthwith by signing and executing the consent which is hereto annexed and forms part hereof.

IN WITNESS WHEREOF, we have made and signed this certificate this 12th day of November, 1918.

BUELL HOLLISTER
President

C. E. DANFORTH
Secretary

State of New York,
County of New York—ss.:

BUELL HOLLISTER and C. E. DANFORTH, being duly sworn, each for himself, deposes and says that the said Buell Hollister is the President, and the said C. E. Danforth is the Secretary of the STENTOR ELECTRIC COMPANY, INC., and that the foregoing certificate signed by them, respectively, is true to the best of the knowledge, information and belief of each of said deponents. Deponents further say, each for himself, that the annexed written consent of the stockholders of said corporation, consenting to the dissolution forthwith of the said corporation, was so executed at said meeting of stockholders held as

in the foregoing certificate stated, on the 12th day of November, 1918, by the persons executing the same, and that the number of shares set opposite each signature to such consent is the number of shares standing on the books of the corporation in the name of such consenting stockholder, and that the total number of shares issued and outstanding by the said corporation is 1000, and that the number of consenting shares is the entire number of the shares of said stock of said corporation so outstanding as aforesaid.

BUELL HOLLISTER
C. E. DANFORTH

Sworn to before me this
12th day of November, 1918.

EDWARD F. QUINN,
Notary Public,
New York County, N. Y.

CONSENT OF STOCKHOLDERS TO CERTIFICATE.

WE, the undersigned, being the holders and owners of all the shares of stock of the STENTOR ELECTRIC COMPANY, INC., issued and outstanding, owning the number of shares set opposite our names, respectively, do hereby consent that the said corporation be dissolved forthwith, pursuant to section 221 of the General Corporation Law of the State of New York, and we do hereby sign this instrument for the purpose of signifying such consent in writing, as required by the said section 221 of the General Corporation Law.

Exhibit P-137.

IN WITNESS WHEREOF, we have hereunto set our hands and opposite thereto the number of shares of stock held by us respectively, this 12th day of November, 1918.

Names of Stockholders	Number of Shares
BUELL HOLLISTER	255
LEROY R. LYNCH	255
GEORGE R. LEARING	120
C. E. DANFORTH	120
J. L. SPENCE	250

BUELL HOLLISTER
President

Attested by:

C. E. DANFORTH
Secretary.

STATEMENT

The following is a statement of the names and residences of the existing board of directors of Stentor Electric Company, Inc. and of the names and residences of its officers:

Names of Directors	Residences
Buell Hollister	Islip, New York
C. E. Danforth	Hotel Savoy, New York City
J. L. Spence	1837 E. 17th St., Brooklyn, N. Y.

Names of Officers	Residences
Buell Hollister, President	Islip, New York
C. E. Danforth, Secretary	Hotel Savoy, New York City
C. E. Danforth, Treasurer	Hotel Savoy, New York City

Exhibit P-137.

State of New York,
County of New York—ss.:

C. E. DANFORTH, being duly sworn, says that he is the secretary of Stentor Electric Company, Inc., and that the foregoing statement of the names and residences of the existing directors and officers of said company is true.

C. E. DANFORTH

Sworn to before me this
12th day of November, 1918.

EDWARD F. QUINN,
Notary Public,
N. Y. Co.

WAIVER OF NOTICE

BY DIRECTORS, OF MEETING TO DISSOLVE CORPORATION

WE HEREBY WAIVE all notice whatsoever of the time and place of holding a meeting of the Board of Directors of STENTOR ELECTRIC COMPANY, INC., to be called for the purpose of taking action on a proposition to dissolve the said corporation forthwith in the manner prescribed by Section 221 of the General Corporation Law of the State of New York, and consent that the said meeting be held on the 12th day of November, 1918, at 11:15 o'clock in the forenoon, at the offices of Messrs. Nicoll, Anable, Lindsay & Fuller, No. 61 Broadway, Borough of Manhattan, City of New York, or at such other time and place as may be fixed by adjournment from time to time; and hereby further consent to such action on said proposition as may be resolved upon by a majority of the whole Board

Exhibit P-137.

at any such meeting or adjourned meeting without further or any notice to us, or to any of us.

Dated, New York, November 12, 1918.

BUELL HOLLISTER
C. E. DANFORTH
J. L. SPENCE

187-23-10

STATE OF NEW YORK
DEPARTMENT OF STATE } ss.:

I CERTIFY THAT I have compared the preceding copy with the original Certificate of Dissolution of STENTOR ELECTRIC COMPANY, filed in this department on the 7th day of January, 1919, and that such copy is a correct transcript therefrom and of the whole of such original.

WITNESS my hand and the official seal of the Department of State at the City of Albany, this sixth day of July, one thousand nine hundred and thirty-nine.

FRANK S. SHAYS
Deputy Secretary of State.

WAIVER OF NOTICE BY STOCKHOLDERS
OF
MEETING FOR DISSOLUTION

We, the undersigned, being all the stockholders of the STENTOR ELECTRIC COMPANY, INC., owning the number of shares of stock set opposite our names, respectively, hereby waive all notice whatsoever of a meeting of stockholders, to be held on the 12th day of November, 1918, at 11:30 o'clock in the afternoon, at the offices of Messrs. Nicoll, Anable, Lindsay & Fuller, No. 61 Broadway, Bor-

ough of Manhattan, City of New York, for the purpose of voting on a proposition that the corporation be dissolved forthwith, pursuant to section 221 of the General Corporation Law of the State of New York, and we consent and request that such meeting be held at the time and place aforesaid, and further consent to such action on the said proposition as may be resolved upon at such meeting by the owners of not less than two-thirds of such stock voting as such meeting, in person or by proxy.

Dated, the 12th day of November, 1918.

Names of Stockholders	Number of Shares
Buell Hollister	255
Percy R. Lyons	255
George H. Learing	120
C. E. Danforth	120
J. L. Spence	250

(Seal)
187-23-11

Plaintiff's Exhibit 138.

State of New York,
Department of State—ss.:

IT IS HEREBY CERTIFIED, That I have made an examination of the corporation index for certificates filed in this department by

STENTOR ELECTRIC MANUFACTURING COMPANY, INC.,

and that upon such examination I find the following:

Certificate of Incorporation
Electrical Experiment Company, Inc.
Filed May 20, 1913.

Exhibit P-138.

Certified Copy of Order authorizing the Electrical Experiment Company, Inc. to Change its Corporate Name to Stentor Electric Manufacturing Company, Inc. Filed May 22, 1914.

Affidavit of Publication of Order authorizing the Electrical Experiment Company, Inc. to Change its Corporate Name to Stentor Electric Manufacturing Company, Inc. Filed June 19, 1914.

Certificate of Dissolution of Stentor Electric Company, Inc. Filed January 7, 1919.

Certificate of Dissolution of Stentor Electric Manufacturing Company, Inc. Filed May 26, 1919.

IT IS FURTHER CERTIFIED That no other certificates have been filed by such Corporation.

WITNESS my hand and the official seal of the Department of State at the City of Albany, this sixth day of July, one thousand nine hundred and thirty-nine.

FRANK S. SHAYS,
Deputy Secretary of State.

Plaintiff's Exhibit 142.

February 20, 1925

MANUFACTURERS' CONTRACT BILLING RECORD

Name—The Willoughby Company,
Utica, New York.

Terms: Contract — Complete price $16.90

Type Equipment Supplied	Se g. Price
Stentor Autophone set	$16.90

This price effective per Mr. Poland's letter of February 19th, 1925. We received an order calling for 5 sets of equip.

Date 2/24/25

Approved J. W. PATTON

Plaintiff's Exhibit 143.

January 6, 1925

MANUFACTURERS' CONTRACT BILLING RECORD

Name—Rolls-Royce of America, Inc.,
Springfield, Mass.

Terms: Contract — Complete price $14.78

Type Equipment Supplied	Seg. Price
Stentor Autophone Set Complete	$14.78
Transmitter	
Receiver	
Horn	
Reel	
Terminal Block	

This price effective on all invoices to this company, per Mr. Poland's letter of Dec. 18th, 1924.

Date 1/7/25

Approved J. W. PATTON

Plaintiff's Exhibit 144.

February 20, 1925

MANUFACTURERS' CONTRACT BILLING RECORD

Name—Fleetwood Metal Body Company,
New York City, N. Y.

Terms: Contract — Complete Price $12.00

Type Equipment Supplied — Seg. Price

Stentor Autophone set, with cord only for cord winder — 12.00

Same as Fisher Body

This price effective February 20th, 1925 per Mr. Poland's letter of this date.

Date 2/24/25

Approved J. W. PATTON

Plaintiff's Exhibit 145.

April 28, 1925

MANUFACTURERS' CONTRACT BILLING RECORD

Name—Ford Motor Company,
Detroit, Michigan.

Terms: Contract Complete price $14.20

Type Equipment Supplied	Seg. Price
Stentor Autophone Set Complete	14.20

This price effective per Mr. Poland's letter of April 27th, 1925.

Date 4/28/25

Approved J. W. PATTON

Plaintiff's Exhibit 146.

November 23, 1925

MANUFACTURERS' CONTRACT BILLING RECORD

Name—Healey & Company,
Keyport, N. J.

Terms: Contract — Complete price

Type Equipment Supplied	Seg. Price
STENTOR	
Model #814658, Receiver B-2	3.70
#814660, Reel B-6	3.60
#814645, Horn A-3	3.00
#814662, Term. block	.50
#814663, Wire	.60
#814872, Transmitter BN-265	5.50

This price effective per Mr. Nelson's letter of Nov. 13th, 1925.

Date 11/23/25

Approved B. W. COOPER

Defendant's Exhibit 4.

No. 1507

UNITED STATES OF AMERICA

(EMBLEM)

THE NATIONAL ARCHIVES

To all to whom these presents shall come, GREETING:

I CERTIFY That hereto annexed is a true copy of the document described below, the original of which is in the official custody of the archivist of the United States and is on file in The National Archives to wit:

"Preliminary Report of Test of Loud Speaking Telephone System", dated July 24, 1917, signed by Lieut. Comdr. Norris, U. S. N.

IN TESTIMONY WHEREOF, I, R. D. W. Connor Archivist of the United States, have hereunto caused the Seal of The National Archives to be affixed and my name subscribed by the Administrative Secretary of the National Archives, in the District of Columbia, this 23rd day of June 1939.

R. D. W. CONNOR
Archivist of the United States
By THAD PAGE
Administrative Secretary

(SEAL)

Exhibit D-4.

July 24, 1917. Test #272

PRELIMINARY REPORT OF TEST OF LOUD SPEAKING TELEPHONE SYSTEM.

Submitted by
Stentor Electric Mfg. Co.,
New York City, N. Y.

References: (a) Bu. S. E. Let. #199588-717-L Oct. 10/16.
(b) Ind. Mgr. N. Y. 1st End. I-1333 " 12/16.
(c) E. O. 1534/709-9

Enclosures: (A) Blueprint diagram.
(B) 4 Photos 578, 587, 588, 589.

1. Tests as authorized in reference (a) have been conducted in this Division on a partial installation of an amplifier system of loud speaking telephones submitted by the Stentor Electric Mfg. Co., to determine the suitability for use on capital ships of the Navy.

2. TRANSMITTER.

The transmitting equipment delivered consists of 1 transmitter, desk type, and 4 transformers mounted on a wood panel. The secondary of each transformer is connected through the receiver end of 2 amplifiers in series as shown on blueprint #42676-A. The transmitting ends of the 8 amplifiers connect through two transformers in parallel, each of which supplies 4 or 5 reproducers in series. Six volts storage batteries, not furnished by the exhibitor, were connected to the transmitting and amplifying circuits as shown in diagram. Only one transmitter, and 16 reproducers were furnished, this being considered sufficient to determine the talking qualities of the instruments.

Exhibit D-4.

3. RECEIVER.

The receiver shown on photographs #578 and #587 consists of a double pole magnet in brass watch type case and a tinned diaphragm 17 mils thick in a cast zinc case with mounting lugs and short tube for horn. A thin sheet brass cover slides over the back of the magnet case to protect the terminals. This receiver differs from an ordinary watch case telephone in having the diaphragm held between two 1/8" round rubber gaskets, and having the adjustment made by screwing the magnet case out of the diaphragm case in which it is locked by two brass set screws extending through the threaded portion of the case. It has no sound multiplying device as exists in other loud speakers and depends on the horn for megaphone or concentrating effect.

4. HORN.

The horns used with the receivers are straight, 20" long by 12" maximum width across flaring octagonal section end. They are of tinned iron, japanned with sections spun together. They fit into the short 11/16" diameter nipple of the receiver but are not held by set screws and are easily jarred out.

5. AMPLIFIER.

The amplifier is a relay transmitter, consisting of a receiver and transmitter mounted in a common housing with their diaphragms mechanically connected, and battery supplied to the transmitter end to repeat message through the horn reproducers. Speech distortions in the amplifier receiver and desk transmitter are further distorted in the secondary circuit, making articulation almost impossible. No means of amplifying the sound is provided except by increasing battery voltage to a limited degree.

Exhibit D-4.

6. TRANSFORMERS.

Shell type transformers are used in both the original transmitting and the amplifier reproducing circuit. Those in the latter are mounted in wooden boxes. There is no designation of terminals on the panel. The terminals are made for small wire and telephone type tips. No wiring leads were furnished for the test.

7. ADJUSTMENT FOR TESTS.

The loudness and distinctness was adjusted by altering battery voltage and distance of diaphragm from magnet, until same volume obtained with Western Electric Co., Standard Outfit was obtained. This volume is equal to that given by one reproducer on the ARIZONA. The transmitter took 0.3 ampere and each amplifier 0.5 ampere at 6 volts. Operation tests for volume and articulation, using one test receiver connected the same as any one of 85 receivers on complete equipment, the other receivers on the same circuit being plugged up. The observers stood from 12 to 20 feet from the horn in the attic of building #22, where irregular noises were excluded and the head space was about 7 feet, as near conditions on shipboard as possible. Three of the 5 observers with good hearing were technically trained men with 2 weeks practice, the other two being new, one having never heard this type of phone, and one never having rehearsed this test. One hundred common words of 1, 2 and 3 syllables and 20 short sentences were read by a practical caller in an ordinary tone of voice. Single syllable words could rarely ever be recorded correctly unless in sentences, while three syllable words could usually be recorded correctly. Words recorded approximating the sound of word called were graded 80% correct, as was done in tests in previous systems exhibited.

Exhibit D-4.

8. Results of Articulation.

The following percentages of correctly interpreted words and sentences were recorded.

Observer	Approximate Time Trained.	Correct Words.	Correct Sentences.
A	Four weeks.	67.4 per cent.	90 per cent.
B	Two "	48.0 " "	88 " "
C	Two "	39.4 " "	87 " "
D	One week	41.0 " "	86 " "
E	None	18.8 " "	49 " "
	General average	42.9 " "	76 " "

The above results show that actual percentages depend on the experience of the observer up to a certain degree, and are of comparative value only with other systems made under similar conditions. For serviceable value a well trained listener should correctly record 97% of the sentences practically correct, and at least 80% of detached words equivalent to those used in this test.

9. Life Test.

During preliminary tests of this system, extending over several weeks, the transmitters and amplifier board was subjected to vibration from machinery on same bench, and the receivers were thrown around roughly. No change of adjustment was necessary except slight tuning up for varying voltages for test results which was easily accomplished by screwing the magnet cases. Pounding on amplifiers while talking produced sharp noises in the receiver, but did not break up the speaking going on at same time. Bugle calls blown into the transmitter were almost perfectly reproduced in the horns. In view of lack of adjustment necessary with rough usage given, a sound

reproducing life test was not considered of value. The ruggedness of these instruments can better be determined by their usage on railroads, and of the same make of receiver now being used on Merchant Auxilliaries.

10. Workmanship and Material.

The receivers which are the only instruments to be used in exposed places are sufficiently watertight to prevent any danger of injury to windings. The effect of electrolysis between the adjoining brass and zinc cases is however appreciable, .005 volt was produced on partially immersing the receiver in salt water. No provision is made for waterproofing by gaskets, the leading in wires. The receiver horns are of 20 mil iron, too thin to withstand knocks on shipboard and easily corrosive although tinned and painted. No plan has been submitted for selective transmitting and busy signals to show at each transmitter, as called for in specifications.

11. Disadvantages.

The Stentor system is not as easily maintained as a system operated off the main lighting system, since it entails the care of special storage batteries from 6 to 10 volts as shown in diagram. The material used in horns and reproducers is not sufficiently noncorrosive for ship's use. The apparatus for automatically signalling between transmitter stations to show if line is busy has not been manufactured or designed and no selective switches are submitted for operating groups of receivers together or singly as required.

12. Conclusion.

Although the Stentor amplifier loud speaking telephone system for capital ships is in an incomplete form, it is considered from poor results shown on articulation tests

Exhibit D-7.

that it is suitable only for bugle calls and well known general calls, subject to changes in design indicated in Par. 11 of this report.

STEWART NORRIS,
Lieut. Comdr. U. S. N.

CH:JEC:U

Defendant's Exhibit 7.

No. 1507

UNITED STATES OF AMERICA

(EMBLEM)

THE NATIONAL ARCHIVES

To all to whom these presents shall come, GREETING:

I CERTIFY That hereto annexed is a true copy of the document described below, the original of which is in the official custody of the archivist of the United States and is on file in The National Archives to wit:

"Report of test of Stentor Loud Telephone set", dated June 1st, 1916, signed by H. C. Mustin.

IN TESTIMONY WHEREOF, I, R. D. W. Connor Archivist of the United States, have hereunto caused the Seal of The National Archives to be affixed and my name subscribed by the Administrative Secretary of the National Archives, in the District of Columbia, this 23rd day of June 1939.

R. D. W. CONNOR
Archivist of the United States

By THAD PAGE
Administrative Secretary

(SEAL)

Exhibit D-7.

U. S. NAVY AERONAUTIC STATION,
PENSACOLA, FLA.

June 1st, 1916.

From: Commandant.
To: Navy Department (Operations—Material).
Via: Commander of the Air Service.
Subject: Report of test of Stentor Loud Telephone set.

1. The dry cells as furnished with the Stentor Loud Telephone set were useless and had to be replaced by others.

2. As tested alongside a Curtiss OXX-2 motor running full power, communication with the Stentor Loud Telephone set was possible but very indistinct. The uncertainty of the pilot and observer understanding each other with this set makes very doubtful the advisability of using it. Under service conditions, such as fire control or scouting there should be no doubt as to the exactness of communication between observer and pilot.

3. The head gear, etc., are very cumbersome.

4. Unless the Stentor Loud Telephone set be improved additional purchases of this set are not recommended.

H. C. MUSTIN

Exhibit D-12.

1st endorsement N. C. 1080-16.

USS North Carolina Pensacola, Florida, 5 June 1916.
From: Commander of the Air Service.

To: Secretary of the Navy,
Bureau of Steam Engineering.

Via: Navy Department (Operations—Material)
1. Forwarded approved.

MARK S. BRISTOL

Navy Department JUN 8 1916
Office of Chief of Naval Operations (Material)
Forwarded to Bureau of Steam Engineering

Defendant's Exhibit 12.

No. 1521

UNITED STATES OF AMERICA

(EMBLEM)

THE NATIONAL ARCHIVES

To all to whom these presents shall come, GREETING:

I CERTIFY That hereto annexed is a true copy of the document described below, the original of which is in the official custody of the archivist of the United States and is on file in The National Archives to wit:

Memorandum dated Feb. 22, 1918, from the United States Navy Yard, New York, N. Y., to the Bureau of Steam Engineering, on the subject of

Exhibit D-12.

"Loud Speaking Telephones supplied by Stentor Electric Mfg. Co., and Callaphone Co., of New York".

IN TESTIMONY WHEREOF, I, R. D. W. Connor Archivist of the United States, have hereunto caused the Seal of The National Archives to be affixed and my name subscribed by the Administrative Secretary of the National Archives, in the District of Columbia, this 23rd day of June 1939.

R. D. W. CONNOR
Archivist of the United States

By THAD PAGE
Administrative Secretary

(SEAL)

FEB 22 1918

To: Bureau of Steam Engineering.
Subject: Loud Speaking Telephones supplied by Stentor Electric Mfg. Co., and Callaphone Co., of New York.

1. One 20 volt, full intercommunicating set supplied on New York Contract #2047, by the Stentor Electric Mfg. Co., and one similar service set supplied by the Callaphone Co., on New York Contract #2060, have been tested for comparative operating qualities at this Yard.

2. It was found that the Callaphone outfit was louder and more distinct than the Stentor outfit, and it is considered that the Stentor telephones are only about 75% efficient in talking qualities compared with the Callaphone telephones at 100%.

Exhibit D-35.

3. The above information is furnished for the Bureau's guidance in connection with future purchases of loud speaking telephones.

SIGNATURE ILLEGIBLE

Defendant's Exhibit 35.

N. S. E. 5.

ADDRESS BUREAU OF STEAM ENGINEERING DEPARTMENT,
NAVY DEPARTMENT,

AND REFER TO
425307-111-Q-2-L
ENCLOSURES

NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
Washington, D. C.

October 11, 1919.

Gentlemen:

The Commanding Officers of the destroyers McKee (#87), Robinson (#88), Harding (#91) and Gridley (#92) report that the loud speaking telephones installed on the vessels under their command are practically useless. Abstracts of their respective letters are quoted below for your information.

McKee (#87)

"In reply to the above reference (#5387), you are informed that the loud speaking telephones installed in the engine and steering engine rooms on

board this vessel have not proved satisfactory, in that they fail to overcome the noise while the vessel is underway."

ROBINSON (#88)

"The loud speaking telephones on this vessel are not satisfactory. The buzzing of the motor generators makes it difficult to hear conversation over it. The actual cause of the trouble cannot be determined, but the installation is not, in all respects, satisfactory."

HARDING (#91)

"The loud speaking telephones installed on this vessel have proved practically useless due to difficulty in keeping them in good working order and to the impossibility of hearing the voice through the receivers in compartments where there is any noise."

GRIDLEY (#92)

"The loud-speaking telephones on this vessel are not satisfactory for the following reasons:

(a) The sound transmitted is not loud.

(b) The sound transmitted is not clear.

(c) The receivers are too delicate and burn out if the voltage rises slightly above the designed working voltage. The main switches must be kept open to protect the instruments and they are therefore never ready for instant use.

These telephones were inoperative upon the arrival of this vessel at Norfolk from San Francisco. They were repaired there by the Yard.

At present these telephones can be used with about the same results as with an ordinary phone

Exhibit D-35.

except that the sound heard is hardly so clear. Word must first be sent down to close and fuse the circuit, as this is kept open. In the engine room the sound transmitted can be heard several feet when everything else is quiet."

In view of the fact that these loud speaking telephones have never given satisfactory service, the Bureau considers that these unsatisfactory loud speaking telephones should be replaced satisfactorily as soon as possible.

Very respectfully,

M KRANSTEN
Assistant to Bureau.

Klaxon Co.,
Metropolitan Tower,
New York City.

Copy to Inspector of Machinery, U. S. Navy, Union Iron Works, San Francisco, Calif. (Reference: Your letters 5814-10/1/19; 5844 and 5845-10/2/19; and 5865-10/3/19.)

Defendant's Exhibit 36.

GENERAL MOTORS CORPORATION
1764 BROADWAY
New York, N. Y.

Please address reply to
33 West 42nd Street
New York, N. Y.

May 16, 1919.

Subject
5C—151
Patent Situation

Mr. C. E. Danforth,
Van Emburgh & Atterbury,
#5 Nassau Street,
New York, N. Y.

Dear Sir:

Referring to the conference with your good self, Mr. Buell Hollister, Mr. D. A. McConnell and Mr. O. C. Friend, regarding the situation on the Stentor Electric Manufacturing Company's affairs at this office on Tuesday, April 29th, we agreed to submit to you copies of statements relative to the patent situation, facts about the commercial situation, facts about devices sold by the Stentor Electric Mfg. Company before making the contract with us of May 20th, 1918, also facts regarding the development which has been and is necessary in order that the devices may meet the conditions necessary in order to perform satisfactorily and continue to operate as they should.

Our patent attorney having this situation in hand is Mr. George C. Dean, 55 Liberty Street, New York, who has been doing work for us a great many years and whose ability in our minds is unquestionable.

Exhibit D-36.

Mr. Dean after studying the patents and the devices which were being manufactured at that time for marketing, makes a very complete report on the Spence patents, copy of which is enclosed for your information and study, and concludes his report as you will notice by saying that the products of the Klaxon-Stentor combination are not covered or protected by existing patents or applications of Spence.

Further that Spence made no inventions capable of supporting any applications or patents that will protect the Klaxon Company on products they are making in the Stentor Division.

This can all be verified by the investigation of anyone whom you may desire to go into the situation further.

As additional information on the whole subject, we asked our Chief Engineer, Mr. P. M. Farmer, to make a report also on this situation and we are enclosing copy of his report of April 25th, also his additional report of April 28th, from which you will learn on studying that it confirms Mr. Dean's opinion to the effect that we acquired nothing in the line of protection on patents under the contract.

In addition to the above reports, Mr. Farmer after reading Mr. Dean's opinion of the situation amplified that by a memorandum pertaining thereto dated April 28th, a copy of which is also enclosed.

Then to make the whole situation complete, we asked Mr. Berg, Manager of the Industrial Sales Division of the Klaxon Company who handles all the sales merchandising of Klaxon-Stentor products, to obtain opinions from our selling engineer, Prof. V. Karapetoff, professor at Cornell University in charge of that study, who has had many years of engineering work with the Western Electric and whose standing is unquestionable, also the findings of the Industrial Sales Department from a commercial standpoint. This is covered by a report from Mr. Berg, copy of which is enclosed.

Exhibit D-36.

Most of this information was touched on at our recent conference and, as you will recall, you expressed a desire to have this information to study.

It was also understood that Mr. D. A. McConnell of the Klaxon Company would go ahead with the development of the Klaxon-Stentor products and devices to a commercial basis, and determine just what the proper relation would be on a revision of the contract now existing with the Stentor Electric Manufacturing Company.

This Mr. McConnell is doing and undoubtedly will shortly ask you, for another conference for the purpose of further discussing this very unsatisfactory situation.

As you appreciate, we both are in the same position as far as the Stentor situation is concerned. What is bad for us is bad for you, and we hope that we will be able to work out a profitable situation for both, but from the outlook that is somewhat doubtful.

In addition to the information submitted, if there is any further information that you desire, we would be very glad to supply you or answer any questions which you may ask.

Trusting we have placed this whole situation before you to your entire satisfaction, we are

Yours very truly,

O. C. FRIEND
United Motors Section

Defendant's Exhibit 53.

No. 1096676

THE UNITED STATES OF AMERICA

To All to Whom These Presents Shall Come:

Whereas Sidney George Brown of London, England, has presented to the Commissioner of Patents a petition praying for the grant of Letters Patent for an alleged new and useful improvement in Telephone-Receivers, a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such cases made and provided, and

Whereas upon due examination made the said Claimant is adjudged to be justly entitled to a patent under the law.

Now therefore these Letters Patent are to grant unto the said Sidney George Brown, his heirs or assigns for the term of Seventeen years from the twelfth day of May, one thousand nine hundred and fourteen, the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this twelfth day of May, in the year of our Lord one thousand nine hundred and fourteen, and of the Independence of the United States of America the one hundred and thirty-eighth.

J. T. NEWTON
Acting Commissioner of Patents

(Seal)

Exhibit D-53.

UNITED STATES PATENT OFFICE

SIDNEY GEORGE BROWN, OF LONDON, ENGLAND.

TELEPHONE-RECEIVER.

1,096,676. Patented May 12, 1914.

Specification of Letters Patent.

Application filed March 27, 1911. Serial No. 617,228.

To all whom it may concern:

Be it known that I, SIDNEY GEORGE BROWN, a subject of the King of Great Britain, residing at 4 Great Winchester street, in the city and county of London, England, have invented certain new and useful Improvements Relating to Telephone-Receivers, of which the following is a specification.

This invention relates to the reproduction of sound by electrical means and has particular reference to telephone receivers, the chief object being to enable a high efficiency of conversion of oscillations or variations of electric current into acoustic vibrations to be obtained.

The usual telephone receiver consists of a polarized electromagnet through the coil of which the line currents pass, and a soft iron diaphragm gripped peripherally and thereby held a short distance away from the electromagnet. Variations in the strength of the line current cause the diaphragm to vibrate, and, in so doing, to set the surrounding air into vibration. The responsiveness of the diaphragm as usually employed and the transmission of its vibrations to the air are imperfect for several reasons. In the first place owing to the peripheral gripping of the diaphragm it cannot vibrate uniformly at all points on its

surface; also owing to the diaphragm serving to complete the magnetic circuit of the electromagnet, its thickness is considerable; and, owing to this thickness of the diaphragm and to its being composed of iron, it is comparatively heavy with the result that its inertia makes it sluggish in action. Moreover in regard to the transmission of the vibrations through the air, sufficient attention has not been paid to the volume of air set in motion and the variations of air pressure for producing the most effective transmission. The dimensions of the ear-drum and of the aural cavity may be taken as invariable factors in such considerations. Now these factors being known, there are certain relations existing between them and the size of the diaphragm, the nature of the air pressure variations, and the volume of air set in motion for the most effective reproduction of the sounds, and the transmission of them to the ear-drum.

The telephone receiver constructed in accordance with the present invention is designed to eliminate the causes of inefficiency above referred to.

According to this invention the diaphragm of the receiver is made extremely light but is so shaped that notwithstanding its extreme lightness it is comparatively rigid. I have found that a diaphragm of aluminum formed conically from a very thin disk of that metal and if necessary suitably stiffened by ribs, or corrugations, or otherwise, possesses the requisite properties to a satisfactory degree. The thin disk of aluminum may conveniently be spun into a conical shape with a flat center piece.

It is advantageous for the strength to be greatest at the center and progressively less toward the edge, and by starting the spinning operation at the edge and working toward the center, this property of the spun disk will be naturally produced owing to the graduated thickness of the disk. To increase this effect resort may be made to the known expedient of assembling several disks of differ-

ent diameter into a pile. The thickness of such disks may be of the order of 2½ thousandths of an inch. Some idea as to the lightness of a diaphragm so formed may be gained from the fact that when it is allowed to drop to the ground it does not fall like a heavy mass of metal, but moves gently through the air. The mere conical shape of the diaphragm will insure a considerable amount of rigidity but this may be increased by providing radial ribs or corrugations on it. This diaphragm is mounted upon a resilient member which responds to the variations of line current; the said resilient member may consist of a metal strip or reed containing within itself, by reason of a cutaway portion, its own control and that of the diaphragm. The diaphragm is preferably attached at its center to a point on the metal strip or reed slightly eccentric with respect to the axis of the coil through which the line currents pass. The diaphragm is so arranged as to be free to move as a whole, that is to say all points on its surface vibrate equally, and to insure this action the periphery of the diaphragm is either quite free or is attached to the usual casing by a mere thin ring of flexible material. The inner face of the cover or ear-piece of the receiver is shaped to conform approximately to the shape of the diaphragm, and is situated at a comparatively short distance from this diaphragm, thereby avoiding an undue amount of space between the diaphragm and the cover or ear-piece.

In order that the invention may be clearly understood and readily carried into effect I will now describe the same more fully with reference to the accompanying drawings, in which:—

Figure 1 is a plan with the cover removed, and Fig. 2 a sectional elevation, of one constructional form of my improved receiver. These drawings represent a full size receiver, and the more important dimensions such as the diameter of the diaphragm, the extent of its eccentricity,

and the volume and shape of the air space between the diaphragm and the ear-piece or cover, are what I have found by experiment to give good results for hearing with the receiver close to the ear, by reason, no doubt, of the relation these dimensions bear to the diameter of the ear-drum and the volume of the aural cavity. Where it is desired to make the sounds travel out into the room, a receiver of larger size is preferable. Fig 3 is a detail view of a diaphragm built up of several diaphragms of different diameter.

A is the casing and B the ear-piece or cover of the receiver.

C represents the coil and D the core of a polarized electromagnet of which N and S are the north and south poles respectively.

E is a metal reed one end of which is held down upon a bridge piece E′ on the casing E by two adjusting screws E^2; the free end of this reed extends over the core D of the electro-magnet. A portion of E^3 of this reed is cut away to increase its flexibility and decrease its weight. I have found that a suitable free period for the reed is from eight hundred to one thousand. The extent to which the reed E can approach the core D may be regulated by packing some layers of paper between these parts or by arranging a set screw to make contact with the reed.

F is a light aluminum diaphragm of conical form. It is attached at its center to the reed E at a point eccentric with respect to the axis of the core D, the eccentricity being toward the fixed end of the reed. Although I have shown the best position for attaching the diaphragm in the particular receiver illustrated, the best position on any reed can be found by experiment by means of a stethoscope and by exploring the reed with the aid of a movable diaphragm.

The diaphragm F is flexibly attached at its periphery by a ring F′ of tissue paper or other suitable material

that will not exert appreciable restraint upon the diaphragm, to a removable flange on the casing A. This ring F′ may be attached to the diaphragm and to the aforesaid flange by adhesive.

It will be understood that owing to the extreme lightness of the diaphragm and to its freedom from peripheral constraint, it will be highly responsive to movements of the reed E and will vibrate as a whole. It will also be observed that the function of the reed E is not to set the air in motion, but only to carry the diaphragm and control its movement. This reed contains, within itself, by reason of its cut away portion E′, the means of its own control and that of the diaphragm, and also serves to complete the magnetic circuit; the diaphragm forms no part of this circuit. The inner face of the cover or ear piece B conforms approximately to the shape of the diaphragm and its distance from the diaphragm is such as to give only the requisite air space between these two parts. The sectional area of the central hole or holes in the ear-piece is suitably proportioned to the aforesaid air space.

Although the invention has been described and illustrated with reference to a "watch" type of receiver, it is of course equally applicable to the long handle type of receiver.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a telephone receiver, a coil through which the line currents pass, a resilient metal reed responsive to variations of current in the coil, and having an intermediate cut-away portion to impart inherent flexibility, a light rigid peripherally unrestrained conical diaphragm carried by its center on said reed, and an ear piece situated over the diaphragm.

Exhibit D-53.

2. In a telephone receiver, a polarized electromagnet, a coil through which the line currents pass, a resilient metal reed responsive to variations of current in the coil and having an intermediate cut-away portion to impart inherent flexibility, a light peripherally unrestrained conical diaphragm carried by its center on said reed, and an ear piece situated over the diaphragm.

3. In a telephone receiver, a polarized electromagnet, a coil through which the line currents pass, a resilient member responsive to variations of current in the coil, a light peripherally unrestrained conical diaphragm carried by its center on said member eccentrically with respect to the electromagnet, and an ear piece situated over the diaphragm.

4. In a telephone receiver, a polarized electromagnet, a coil through which the line currents pass, a resilient metal reed serving as electromagnet armature and having an intermediate cut-away portion to impart inherent flexibility, a peripherally unrestrained conical diaphragm carried by its center on the free end of the said armature, and an ear piece situated over the diaphragm.

5. In a telephone receiver, a coil through which the line currents pass, a resilient metal reed responsive to variations of current in the coil and having an intermediate cut-away portion to impart inherent flexibility, a light peripherally unrestrained conical diaphragm carried by its center on said reed, and an ear piece the inner face of which conforms approximately to the conical shape of the diaphragm.

6. In a telephone receiver, a casing, a polarized electromagnet attached to the back of the casing, a coil through which the line currents pass, a resilient metal

reed responsive to variations of current in the coil and having an intermediate cut-away portion to impart inherent flexibility, a light conical diaphragm carried by its center on said reed with its apex pointing toward the back of the casing, and a cover or ear-piece with a conical inner face conforming approximately to that of the diaphragm.

7. In a telephone receiver, a diaphragm comprising a conically shaped sheet of metal thickest at the center and progressively thinner toward the periphery, and a resilient member for carrying said diaphragm by its center.

8. In a telephone receiver, a conically spun aluminum diaphragm thickest at the center and progressively thinner toward the periphery, and a resilient member for carrying said diaphragm by its center.

9. In a telephone receiver, a diaphragm comprising a sheet of metal having a flat centerpiece and a conical flange portion the thickness of which decreases progressively toward the periphery, and a resilient member for carrying said diaphragm by its center.

10. In a telephone receiver, an aluminum diaphragm comprising a flat centerpiece and a conically spun flange portion the thickness of which decreases progressively toward the periphery, and a resilient member supporting the diaphragm by its center.

11. In a telephone receiver, a casing, a coil through which the line currents pass, a resilient member responsive to variations of current in the coil, a light conical diaphragm carried by its center on said member, an ear piece situated over the diaphragm, and a flexible ring of material connecting the periphery of the diaphragm to the

casing, said material being so thin and light as to exert no appreciable restraint upon the diaphragm.

12. In a telephone receiver, a casing, removable flange thereon, a polarized electromagnet, a coil through which the line currents pass, a resilient member responsive to variations of current in the coil, a light rigid diaphragm carried by said resilient member, and a thin flexible ring of material connecting the periphery of the diaphragm to the aforesaid removable flange, said material being so thin and light as to exert no appreciable constraint upon the diaphragm.

In testimony whereof I affix my signature in presence of two witnesses.

SIDNEY GEORGE BROWN.

Witnesses:

W. HENRY HARVEY,
W. J. SKERTEN.

Defendant's Exhibit 56.

UNITED STATES PATENT OFFICE

SIDNEY GEORGE BROWN, OF LONDON, ENGLAND.

TELEPHONE-TRANSMITTER.

Specification of Letters Patent.

1,096,677. Patented May 12, 1914.

Application filed January 3, 1912. Serial No. 669,150.

To all whom it may concern:

Be it known that I, SIDNEY GEORGE BROWN, a subject of the King of Great Britain, residing at 4 Great Winchester street, in the city and county of London, England, have

Exhibit D-56.

invented certain new and useful Improvements Relating to Telephone-Transmitters, of which the following is a specification.

This invention relates to telephone transmitters.

The diaphragm of the ordinary telephone transmitter is peripherally gripped, with the result that since it cannot vibrate uniformly at all points on its surface its responsiveness to the acoustic vibrations falling upon it is far from being efficient; moreover it is usually comparatively heavy with the result that its inertia makes it sluggish in action. With a view to rendering the diaphragm more free to vibrate uniformly, it has been proposed to provide for flexibility at its peripheral support, but the essential conditions necessary for high efficiency have not, so far as I am aware, been fully realized. Owing to the great difference between the density of air and of solid materials such as are used for diaphragms there is a tendency for a large part of the energy of the air vibrations produced by speaking into the transmitter to be reflected from the surface of the diaphragm upon which the air beats. Hence, one of the main essential conditions for a diaphragm is extreme lightness; a comparatively large surface being essential, extreme lightness involves extreme thinness. An extremely thin diaphragm yields to the impacts of the vibrating air, a large percentage of the energy of the air being thus absorbed by the substance of the diaphragm. It is however useless to transfer the energy of the vibrating air to the diaphragm unless the latter is able to transmit it to some point where it can be usefully employed. If, for instance, the diaphragm were able to vibrate without control, its kinetic energy could not be utilized, and it therefore follows that a further main essential property of the diaphragm must be symmetrical rigidity. A simple and efficient way of making the diaphragm rigid is to impart to it a conical shape. Extreme lightness and symmetrical rigidity are however insuffi-

cient to insure the highest efficiency unless the energy absorbed by the diaphragm and transmitted through its substance is all concentrated at the point where it can be usefully employed; for this reason, peripheral support, even if resilient, is inefficient because it presents a path by which the energy can leak away from the diaphragm to points where no use can be made of it. A further essential condition, therefore, is that the diaphragm must be supported only at its point of symmetry, that is, its center, its periphery being left entirely free, or connected to the inclosing casing merely by a flexible ring of material offering no mechanical restraint upon the diaphragm.

According to the present invention the diaphragm of the telephone transmitter is so formed and mounted that the main essential conditions for efficiency above stated are realized. The diaphragm is made of light material, as for example aluminium, and is unusually thin, the thickness being of the order of 2½ thousandths of an inch. Some idea as to the lightness of the diaphragm may be gained from the fact that if it is allowed to drop to the ground it does not fall like a heavy mass of metal, but moves gently or flutters through the air. The diaphragm is shaped to impart rigidity to it, being preferably conical. It is supported by its center, its periphery being left entirely free, or connected to a mere flexible ring of material that offers practically no restraint and no pathway for the escape of energy. The diaphragm is preferably thickest at its center and of gradually decreasing thickness toward its periphery, so that the energy absorbed by the diaphragm from the adjacent vibrating air is conveyed to the center of the diaphragm with maximum efficiency. Owing to the extreme lightness of the diaphragm, its inertia is small, and its sensitiveness to impressed vibrations is therefore great. In the case of making the diaphragm from a workable metal such as aluminium or aluminium alloy, it may conveniently be

spun from a disk into a conical shape with a flat center piece; by starting the spinning operation at the edge and working toward the center the desirable result of minimum thickness at the edge and graduated thickness toward the center is obtained. To increase this effect several such disks of different diameters may be assembled into a pile, and these disks may if desired differ in their conical angles for increased stiffness. The stiffness or rigidity of the diaphragm may also be increased, if desired, by forming radial ribs or corrugations on it. The diaphragm is attached by its center to the mica disk or other inclosing member of the usual granular carbon cell or "button", forming part of the transmitter.

A further point of importance in obtaining efficiency in a telephone transmitter is the nature of the air space that is adjacent to the surface of the diaphragm and contains the air by means of which the vibrations imparted to the air by speaking are conveyed through the aperture at the base of the usual mouth piece and up to the actual surface of the diaphragm. In this connection particular care should be taken in the formation of the space between the narrow end of the mouth piece and the actual surface of the diaphragm; this space should be such as to maintain the pressure conditions existing at the narrow end of the mouthpiece and thus prevent any appreciable loss in energy transmission by a sudden drop in pressure or otherwise. In order to reduce the excessive amount of space presented by a conical diaphragm, the cover piece to which the narrow end of the mouth piece is attached is conveniently coned inwardly on its inner face so as to conform approximately to the shape of the diaphragm. According to a further feature of the present invention, therefore, the amount of air space adjacent to the surface of the diaphragm is in some cases purposely reduced, below what it would be in the case of a conical or dished diaphragm and a flat cover piece, by shaping the inner

surface of the latter to correspond to some extent to the contour of the diaphragm; for instance, in the case of a conical diaphragm, the inner surface of the cover piece may be formed conically also.

It has been found in actual practice that the proportion of energy transferred from the air to the diaphragm in a telephone transmitter constructed as above described is from four to six times as great as the proportion transferred in the ordinary transmitter in common use at the present time.

In the accompanying drawings:—Figure 1 is a sectional elevation of one form of granular carbon cell transmitter constructed in accordance with my invention. Fig. 2 shows a modified construction in which a blade spring is provided to control the diaphragm. Fig. 3 is a sectional elevation of a "button type of transmitter, and Fig. 4 a "solid-back" type of transmitter constructed in accordance with the invention. Fig. 5 is a sectional elevation and Fig. 6 a plan of a transmitter in which the diaphragm is supported at three points instead of at its center. Fig. 7 is a sectional elevation of a granular form of the transmitter in which the diaphragm is trumpet-shaped instead of being truly conical and Fig. 8 shows a further modification of this kind. Fig. 9 is a view showing a still further modification of the diaphragm.

A is the casing of the transmitter, B the cap or cover piece, C the ebonite mouth piece, D the diaphragm, and E the variable resistance device within the casing A.

In the construction shown in Figs. 1 and 2 the variable resistance device E is the ordinary granular carbon cell, and the flat center piece of the conical diaphragm D is secured to the mica disk E′ of the device E. To the opposite face of the mica disk a sheet of carbon is secured, and this sheet may if desired be ribbed or corrugated or otherwise stiffened so as to increase the strength and rigidity of the center portion of the diaphragm as well as

to effect a good electrical contact with the contents of the cell. The air space in front of the diaphragm is preferably separated completely from the air space behind the diaphragm by a thin ring D′ of pliable material fastened to the periphery of the diaphragm and to the body of the transmitter, or preferably to a removable ring clamped between the cover piece and the casing. This ring D′ may be formed of tissue paper of say, 1/3000 of an inch thick, the essential condition being that the ring should be narrow, thin, and resilient, so as to absorb as little energy as possible from the free edge of the diaphragm. Preferably, the ring consists of an extremely thin ring of collodion and is attached to the periphery of the diaphragm and to the removable ring by placing the collodion ring in position and "painting" its edges with liquid collodion which dries up and establishes a firm joint. The thin solid collodion may be formed by spreading out a quantity of liquid collodion on a sheet of glass and allowing the collodion film so formed to solidify by drying.

In Fig. 2 the diaphragm D instead of being controlled or restrained in its movements by a mica disk, is secured to a blade spring F, to which also is secured a carbon disk E^2. The said disk E^2 is peripherally uncontrolled and bears upon carbon balls or granules located within and constituting part of the variable resistance device E. The carbon disk E^2 may be connected to other parts of the blade spring than that shown, say to a point nearer its point of support, if necessary; also any other form of carbon cell may be employed.

In Fig. 3 the diaphragm D is shown connected to the common "button" type of variable resistance device.

In the construction shown in Fig. 4 the carbon cell is of the kind in which the face of the lower block is circularly notched, as shown in dotted lines. The upper block or plate, which may conveniently consist of carbon

coated on the back with a thin layer of copper, has fixed to it a small base plate E^3 from which projects a screw-threaded center post E^4. The conical diaphragm D, instead of being rendered especially stiff at the center by being thicker there, may be of uniform thinness, the great stiffness at the center being obtained, as shown, by raising the center into the form of a cone, the diaphragm being then held in position by the engagement of the flattened apex of this conically formed center with the aforesaid center post E^4. Thus, the whole vibrating mass is of great lightness. The V-shaped channel between the two oppositely directed conical surfaces rests upon the back of the upper block or plate of the carbon cell, pinching the supporting plate of mica between it and the said block or plate.

In the arrangement shown in Figs. 5 and 6 the channel between the two oppositely directed conical surfaces of the diaphragm D is flattened, and the diaphragm is attached at three triangularly spaced points to three carbon cells mounted in an insulating (ebonite) support. These cells may work in series or in parallel, depending upon the manner in which the connections are made. If they work in parallel, the diaphragm may of course have electrical connection with each of the cells, but, if they work in series an insulating washer must be placed between the channel of the diaphragm and one or more of the carbon cells. The means shown in the figure for holding down the diaphragm consist of a plate and post such as those shown in Fig. 4 at E^3 and E^4 respectively, and a spring washer E^5 located beneath the channel of the diaphragm.

The chief feature of constructional importance in the transmitter shown in Fig. 7 is the trumpet-like formation of the main part of the diaphragm.

Fig. 8 represents a further constructional form of transmitter with a trumpet-shaped diaphragm. In this case the carbon cell is shown as hemispherical and the

diaphragm is open-ended, the circumference of its smaller end being attached to the circumference of the hemispherical carbon cell. The cover piece B is made to conform in shape to the diaphragm. The conformation of the inner surface of the cover piece B with the contour of the diaphragm is desirable in the case of a transmitter of the design shown in Fig. 8, or in any case where the instrument is rather large and the space corresponding to the depression of the diaphragm is in consequence large, but where the transmitter is of the dimensions corresponding to Fig. 2, for instance, which is full size, the cover piece need not be specially designed in this respect.

As hereinbefore stated, the diaphragm is preferably of graduated thickness from the center outward, the minimum thickness being at the periphery. If desired, several such diaphragms of different diameter may be assembled, and they may differ not only in diameter but also as regards the degree to which they are coned, as shown for example in Fig. 9.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A telephone transmitter comprising a variable resistance device, a casing containing said device, a mouth piece carried by the casing for conveying sound waves into the same, a light, peripherally unrestrained conical diaphragm the thickness of which averages a few thousandths of an inch but decreases progressively toward the periphery, and means securing the diaphragm at its central region to the movable member of the variable resistance device.

2. A telephone transmitter comprising a variable resistance device, a casing containing said device, a centrally perforated cover piece on the casing, a mouth piece

carried by the cover piece, a light, peripherally unrestrained, conical diaphragm the thickness of which averages a few thousandths of an inch but decreases progressively toward the periphery, and means securing the diaphragm by its center to the movable member of the variable resistance device.

3. A telephone transmitter comprising a variable resistance device, a casing containing said device, a centrally perforated cover piece on the casing, a mouth piece carried by the cover piece, a peripherally unrestrained, conical diaphragm of aluminium the thickness of which averages two and a half thousandths of an inch but decreases progressively toward the periphery, and means securing the diaphragm by its center to the movable member of the variable resistance device.

4. A telephone transmitter comprising a variable resistance device, a casing containing said device, a mouth piece carried by the casing for conveying sound waves into the same, a light conical metal diaphragm the thickness of which averages a few thousandths of an inch but decreases progressively toward the periphery, means securing the diaphragm by its center to the movable member of the variable resistance device, and a ring of flexible material of the order of one three-thousandths of an inch thick, connecting the periphery of the diaphragm to the interior of the casing.

5. A telephone transmitter comprising a variable resistance device, a casing containing said device, a centrally perforated cover piece on the casing, a mouth piece carried by the cover piece, a conical aluminium diaphragm the thickness of which averages two and a half thousandths of an inch but decreases progressively toward the periphery, means securing the diaphragm by its center to the movable member of the variable resistance device, a removable flange within the casing, and a ring of flexible

material of the order of one three-thousandths of an inch thick connecting the periphery of the diaphragm to the flange.

6. A telephone transmitter comprising a variable resistance device, a casing containing said device, a centrally perforated cover piece on the casing, a mouth piece carried by the cover piece, a conical aluminium diaphragm the thickness of which averages two and a half thousandths of an inch but decreases progressively toward the periphery, means securing the diaphragm by its center to the movable member of the variable resistance device, a removable flange within the casing, and a ring of thin film collodion connecting the periphery of the diaphragm to the flange.

7. In a telephone transmitter, a variable resistance device, a light, conical, peripherally unrestrained diaphragm having its central part coned in the opposite direction to the main part, and means for connecting the central part of the diaphragm to the movable member of the variable resistance device.

8. In a telephone transmitter, a variable resistance device, a light conical diaphragm having its central part coned in the opposite direction to the main part, a base plate secured to the movable member of the variable resistance device, a screw-threaded center post projecting from said base plate, and means for securing the central part of the diaphragm upon the said center post.

In testimony whereof I affix my signature in presence of two witnesses.

SIDNEY GEORGE BROWN.

Witnesses:

T. SELBY WARDLE,
W. J. SKERTEN.

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